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Oil Board Hearing May Be Forerunner Of Co-operative Movement

By V. B. Guthrie
N. P. N. Managing Editor

WASHINGTON, Feb. 16

IT is quite possible that the open hearings conducted by the Federal Oil Conservation Board here Feb. 10 and 11 may be the start of a cooperative movement between the government and the oil industry which will eventually lead to some means of holding back development of new oil fields, particularly when new pools are brought in during periods of over-production and spurred to their peak production quickly through highly competitive drilling.

Just when this may come about, and in just what manner none can say as yet. It is again likely that the detailed manner of bringing about this brake on production, which at this hearing seemed to occasion more comment than the principle itself of holding back production, will be worked out in some fashion that is as yet unthought of, but will be generally accepted by the industry when it comes.

Two Impressions

Two impressions stand out as result of the two-days open hearing which was attended by some hundred persons, the great majority of them men pretty well up in the oil industry. One was that there is a fairly definite idea among most students of the oil industry—even among those who believe that economic laws will solve most of the problems confronting the oil industry—that there is need for some cooperative regulation of the drilling up of new pools when new supplies of crude are not in demand.

There is one wing of the industry which favors such a slowing up in drilling new pools, even by regulatory laws, as a move towards eliminating undue expenditure of capital in drilling operations, and holding new pools as a reserve supply. Government officals are frankly in favor of oil conservation, not in the sense of locking up reserves in the ground for future generations, but to insure ample needs for national defense and to regulate production so that the highest degree of utilization of oil products is secured for this generation and oil is not allowed to go into such channels as competition with cheap coal.

Along with this impression is the second that the government, at least this administration at any rate, is sincere when it speaks of the work of the federal oil board as cooperating with the industry itself. It seems hardly likely the oil board has in mind suggesting regulatory legislation which may force obligations upon the oil industry to the end of conservation. It is more likely that any legislative suggestion in its forthcoming report to President Coolidge will be for the purpose of making it possible for the oil industry itself to handle development of new pools in some cooperative fashion, if indeed it goes that far.

The statements read before the Federal Oil Conservation Board at its open hearing Feb. 10 and 11 and the discussion from the floor are carried practically in full on pages 48 to 56 of this issue. Circumstances under which this material was presented made for a most thoughtful presentation of its case by the industry. Every oil man will find a great deal of value in these addresses and discussions.—Editor.

What may come of the entire work of the Federal Oil Conservation Board will be for the continued cooperation of the government and the industry through future meetings somewhat similar to this one just held, at which the government, itself a heavy owner of oil producing lands, and the oil companies will discuss their problems as frankly as at this meeting. Out of such discussion good in the way of improved methods and greater cooperation could hardly fail to come.

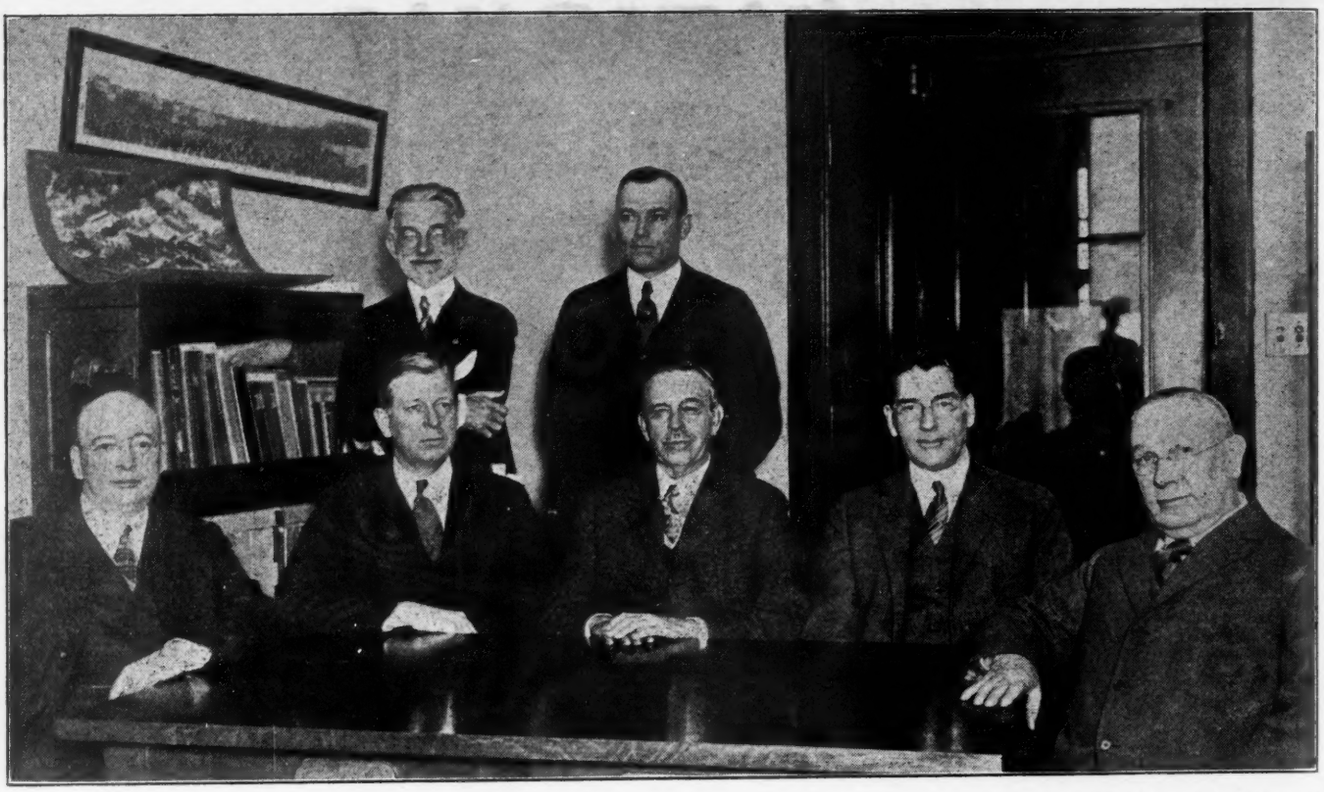
A concrete suggestion along this line was made by T. A. O'Donnell, California Petroleum Corp., Los Angeles, and past president of the institute, to the effect that the industry establish boards of active operators in oil producing states to see that the best operating practice known to the industry be generally followed.

Permanent Boards

"The procedure would be to select the heads of the most active operating companies of the state as a permanent conservation board, to be responsible to the public and to the industry," Mr. O' Donnell wrote the oil board. "The board in turn would appoint a committee, selected in each pool or district from among the general superintendents operating in that district. It would be the duty of these local committees to make periodic inspections and study and recommend improvements. Full publicity should be given all phases of this activity."

The board and those attending the hearings listened to a number of able discussions of the economics of the oil industry and latest technical developments in production methods. Time was given for points to be brought up and questions asked from the floor. In both the papers presented and discussion from the floor a great divergence of opinion developed as to the future oil reserves and methods of developing them, which Secretary Work stated was the best evidence of the good faith and frankness of the industry in presenting its case in the open hearings and in letters to the board.

The board will now start the work of



—*Underwood & Underwood*

Three cabinet officials and prominent leaders of the oil industry. Seated, left to right, W. S. Farish, president American Petroleum Institute, Secretary of War Davis, Secretary of the Interior Work, Secretary of the Navy Wilbur and George S. Davison, president Gulf Refining Co. Standing H. L. Doherty, H. L. Doherty & Co., New York, and W. C. Teagle, president Standard Oil Co., New Jersey.

Registrations at Federal Oil Board Hearing

Hubert Work, Secretary, Interior Dept., Washington.
Herbert Hoover, Secretary of Commerce, Washington.
E. C. Finney, Asst. Secy., Interior Dept., Washington.
C. D. Wilbur, Secretary, Navy Dept., Washington.
Dwight F. Davis, Secretary, War Dept., Washington.
Edw. S. Rochester, Secy. of Federal Oil Conservation Board, Washington.
Brig. Gen. Edgar Jadwin, War Dept., Washington.
W. H. McFadden, Marland Oil Co., Ponca City.
Vernon F. Taylor, Indiana, Pa.
J. Edgar Pew, Vice Pres., Sun Oil Co., Dallas.
E. W. Wagy, Standard Oil Co. of Cal., San Francisco.
W. S. Farish, Pres., American Petroleum Institute, Houston, Texas.
R. L. Welch, Gen. Secretary, American Petroleum Institute, New York.
W. C. Platt, National Petroleum News, Cleveland.
V. B. Guthrie, National Petroleum News, Cleveland.
M. N. Poe, Ohio Oil Co., Findlay.
W. R. Boyd, Jr., Asst. Gen. Secy., American Petroleum Institute, New York.
Geo. S. Davison, Vice Pres., Gulf Oil Corp., Pittsburgh, Pa.
F. C. Proctor, Lawyer, Gulf Oil Corp., Houston, Texas.
Amos L. Beaty, President, The Texas Co., New York.
D. S. Bushnell, Pipe Line Companies, 26 Broadway, New York.
P. R. Applegate, Pipe Line Companies, 26 Broadway, New York.
R. D. Bush, Naval Oil Reserve Commission, San Francisco.
Earl Oliver, Oil Producer & Geologist, Ponca City.
E. J. Bullock, Standard Oil Co. of Indiana, Chicago.
L. V. Nicholas, Pres., National Petroleum Marketers Association, Chicago.
Arthur Knapp, Petroleum Engineer, Philadelphia.
Frank M. Brewster, U. S. Bureau of Mines, Washington.
H. V. Moffett, U. S. Geological Survey, Washington.
H. J. Lowe, U. S. Geological Survey, Washington.
Dr. Van H. Manning, Pan American Western Oil Co., New York.
W. A. Kearney, U. S. Geological Survey, Washington.
W. W. Fleming.
E. W. Marland, President, Marland Oil Co., Ponca City.
John E. Hale, Ponca City.
Northrop Clarey, Standard Oil Co. of N. J., New York.
W. C. Teagle, Pres., Standard Oil Co. of N. J., New York.
E. M. Clark, Vice Pres., Standard Oil Co. of N. J., New York.
E. P. Salisbury, Standard Oil Co. of N. J., New York.
C. F. Kettering, Research Engineer, General Motors Research Corp., Dayton, O.
H. P. Snyder, Director, Marland Oil Co., Little Falls, N. Y.
Capt. Paul Foley, U. S. Navy, Washington.
James C. Crawford, Washington.
Prof. Lester C. Uren, Univ. of California, Berkeley, Cal.
D. B. Dow, U. S. Bureau of Mines, Bartlesville.
C. E. Beecher, Empire Gas & Fuel Co., Bartlesville.
Herbert E. Smith, Spokane, Wash.
J. Lewis Benton, Asst. to Pres., National Association of Manufacturers, New York.
Leod D. Becker, Oil Trade Journal, New York.
Charles Connington, Oil Trade Journal, New York.
I. D. Foss, New York.
W. A. Pierce, Gallup, New Mex.
W. S. Guitteau, New York.
W. H. Lewis, New Castle, Pa.
W. G. Laird, New York.
Fayette B. Dow, American Petroleum Institute, Nat. Petroleum Association, Western Petroleum Refiners Association, Washington.
Willis Crane, Traffic Counsel, Washington.
H. L. Lohnes, c/o Fayette B. Dow, Washington.
Mark L. Requa, San Francisco.
R. V. A. Mills, Washington.
W. W. Duncan, Washington.
H. H. Hill, Chief Petroleum Engineer, U. S. Bureau of Mines, Washington.
Scott Turner, U. S. Bureau of Mines, Washington.
C. P. White, U. S. Bureau of Mines, Washington.
Homer S. Fox, Washington.
James A. Veasey, Carter Oil Co., Tulsa, Okla.
Wm. N. Davis, Pres., Mid-Continent Oil & Gas Association, Bartlesville.
Admiral H. P. Jones, U. S. Navy, Washington.
Commander H. A. Stuart, U. S. Navy, Washington.
F. E. Scott, Washington.
W. C. Hill, Washington.
Lt. Col. W. A. McCain, War Dept., Washington.
Major E. C. Kelton, War Dept., Washington.
Rear Admiral W. W. Phelps, U. S. Navy, Washington.
W. P. Dieppe, Automotive Engineer, New York.
H. K. Griffin, U. S. Bureau of Standards, Washington.
C. B. Huntress, Washington.
Phil Campbell, Prairie Oil & Gas Co., Washington.
R. H. Patchin, New York.
Dr. Julian D. Sears, Administrative Geologist, U. S. Geological Survey, Washington.
Col. Geo. R. Spalding, Louisville, Ky.
W. H. McAlpin, Louisville, Ky.
Wm. Philip Simms, Foreign news editor, Scripps-Howard newspapers, Washington.
Dr. David White, National Research Council, Washington.
Arthur E. Wells, New York.
L. Cammen, New York.
Alexander Deussen, Marland Oil Co., Houston, Texas.
Wallace E. Pratt, Humble Oil & Refining Co., Houston, Texas.
W. C. Mendenhall, U. S. Geological Survey, Washington.
Charles E. Kern, Oil & Gas Journal, Tulsa, Okla.
Henry L. Doherty, Pres., H. L. Doherty & Co., New York.
Oscar H. Reinholt, Sesqui-Centennial Exposition, Philadelphia.
H. I. Smith, U. S. Geological Survey, Washington.
James O. Lewis, Consulting Petroleum Engineer, Tulsa, Okla.
A. H. Redfield, U. S. Bureau of Mines, Washington.
Judson C. Welliver, American Petroleum Institute, New York.
Trell W. Yocum, American Petroleum Institute, New York.

preparing its report to make to President Coolidge.

"This Board, so far as its correspondence is concerned, is about through, perhaps," said Secretary Work, in closing the hearing. "This technical sub-committee has done a tremendous lot of effective work during the last year. The Board itself has done a lot of effective work, but it was not, much of it, in connection with this conservation of oil. But we have about concluded that part of our work. We have already briefed most of the letters, if not all, that have come in during the summer on the different subjects, and we have rebriefed them.

"We will take these papers that were read here today and yesterday and we will put them all in proper shape and will have them printed and will distribute a copy to each of you men who were here in attendance.

"After this report is printed we, of course, will distribute it to all those who are interested. And I feel that we have made very definite progress in the line of conservation. In fact, in the line of oil production I very much appreciate the very liberal attendance. There are twice as many of you important oil men here as I expected to see. You are very much interested.

"That is very encouraging, because we hope to establish close relations in the oil industry, which is the greatest industry in the world, you will all admit that. And the most important thing before this Government at this time, in my opinion, is the study of oil. We have made very definite steps as the owners of the land in the study of this question, and those who produce the oil are closer together now than ever before.

"President Farish spoke of the Institute representative, Mr. Hughes. We will be very glad at any time to cooperate with Mr. Hughes, either in his individual capacity or as representative of the Oil Board. We will call a meeting, of course, later on, if it is desired, so that Mr. Hughes can appear before us.

"But I will be frank enough to say, when the proposition was made to me at first, I did not think, we needed an advocate, and I knew that you did not need an advocate at that time to appear before this Board. And I did not know that Mr. Hughes had had time to advise himself on the things that we needed to know any more thoroughly than you people, but we will be glad to hear or see any one of you or your representative on any occasion or at any time.

"There is not much doubt that if another meeting is desired it would be more to the point to have it after the proceedings of these meetings have been printed, together with the letters that we have received. Then your representative can have a text book from which he can proceed, and if it seems necessary or desired at that time of course we will comply with the request."

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Past Year Important Period of Progress In Venezuelan Development

By Edwin B. Hopkins and H. J. Wasson
Consulting Geologists and Mining Engineers, New York
Presented Before Petroleum Division, A. I. M. E., New York, Feb. 16

THE production of oil in Venezuela for 1925 was about 20,000,000 barrels, or a daily average of better than 50,000 barrels, an increase of more than 100 per cent over 1924 and approximately six times that of 1923. (Fig. 1 and 2). This gain is due primarily to continued active drilling within the proven fields combined with increased marine transportation facilities.

Exports of crude petroleum were made from the five fields now shipping oil through the port of Maracaibo by the three principal producing and shipping companies, namely, Dutch Shell Co., Lago Petroleum Corp. and Venezuelan Gulf Oil Co. which for the year amounted to, in round figures, 19,000,000 barrels. The difference in the amount produced and that exported is accounted for by the amount of oil refined locally, sold as fuel and consumed in drilling operations.

Mene Grande Field

The Mene Grande field, which is entirely controlled by the Caribbean Petroleum Co. (Royal Dutch subsidiary), produced in 1925 about 6,400,000 barrels, or about 1,000,000 barrels, more than in 1924. There were 28 wells completed during the year all of which were producers. The field was considerably extended to the south by the completion of well No. 37, and on the east by a number of wells, thus proving up an additional 1500 acres, making a total of approximately 3300 proved acres.

Well No. 37 was completed early in July and is one of the important wells so far drilled in this field having produced during the last six months about 850,000 barrels, or a daily average of 5000 barrels; also, it maintained a steady production which is rather exceptional as the majority of the wells are intermittent producers due to sanding up. It is understood that preparations are being made to inaugurate a rather extensive drilling campaign in this field to begin early in 1926. Several heavy rotary rigs will be put into operation to replace lighter ones as well as cable tools which have not been so successful. Particular importance has been placed on the discovery of a producing sand in the Pauji shale by well No. 44 when drilled through the present producing sands into this formation. It is believed that several deep tests will be made to this formation during the year. This oil is of higher gravity than that of the regular oil produced in this field.

WHILE Venezuela increased in oil production in 1925 by more than 100 per cent over the previous year, the 1926 gain probably will not be so great in percentage, is the estimate of Messrs. Hopkins and Wasson, expressed at the annual meeting of the American Institute of Mining and Metallurgical Engineers. With the exception of certain paragraphs, the paper is herewith published. It will be published in full later as part of the Transactions of the A. I. M. E.

Venezuela has climbed steadily until it is now in sixth place in the list of producing countries of the world. During the past year two fields started shipping oil. These were the La Paz and Concepcion fields. The older shipping fields are El Mene, Mene Grande and La Rosa.

Pipe line facilities for moving oil to Lake Maracaibo at San Lorenzo remain the same, namely, one 6 inch and one 8 inch. The refinery at San Lorenzo has a capacity of about 3500 barrels per day, the products of which are sold locally in Venezuela.

La Rosa Field

The La Rosa field has experienced greater activity than all of the other fields combined and is accounted for by the competitive drilling of the V. O. C. Ltd., Lago Petroleum Co. and Venezuelan Gulf Oil Co. (Fig. 3). The production for the year is estimated to be 10,300,000 barrels, or a daily average of 30,000 barrels, the field having shown a noticeable increase during the last three months. (See Fig. 4). There were 70 wells drilled during the year all of which were producers when completed.

The La Rosa structure appears to be a broad, anticlinal fold, with development having taken place along the lake shore on its southwest flank for a distance of about 10 kilometers and in one section nearly five kilometers inland on V. O. C. property. There are at least eight square kilometers of proven territory, the field being only partially developed.

There are two so-called producing sand horizons in this field that are locally known as the "La Rosa" (the upper), and the "Santa Barbara" (the lower). The interval between the two sands vary in different parts of the field but they are usually 100 to 175 feet apart; the whole series having a range of thickness of from 250 to 400 feet.

The depth of the producing sands as drilled to date range from 1450 to 2800 feet; the dip being about 650 feet to the mile. No bottom or edge water has been encountered.

In the early part of the year the three above named companies experienced considerable sand trouble due to close drilling and improper handling of the wells. This condition was later overcome by properly spacing the off-set wells and by a better understanding of the sub-surface conditions.

In June progress was considerably retarded by an oil field fire that destroyed a great deal of drilling equipment and temporarily shut down a large number of the wells.

The storage capacity is approximately 1,000,000 barrels; the greater part of which was erected during the year.

El Mene Field

The El Mene field, which is being developed by the English Controlled Oil Fields, Ltd., made remarkable progress during the year.

The production amounted to about 2,650,000 barrels, or a daily average of

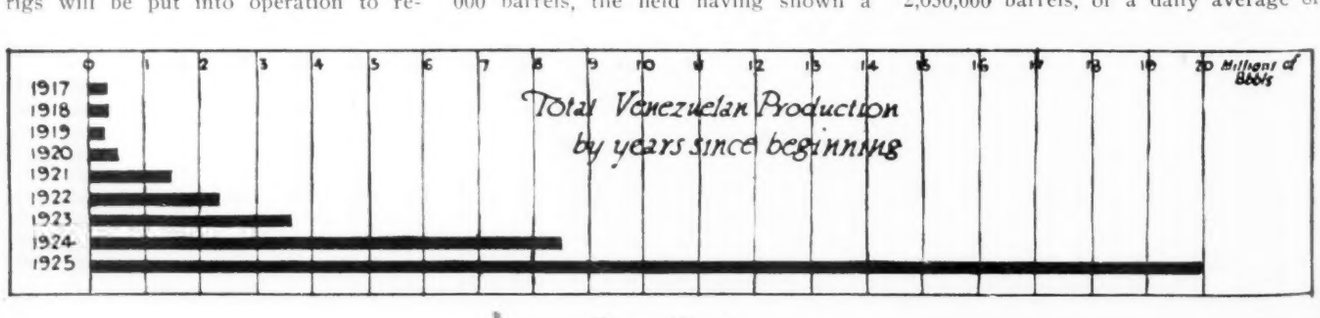

Figure No. 1

7000 barrels, all of which is being taken by the Dutch Shell Co., at Altagracia, the terminus of the company's 4 inch and 6 inch pipe lines on the shore of Lake Maracaibo. A narrow-gauge railway between Altagracia and the field is under construction and should be completed early in 1926.

In all about 90 wells have been drilled, the majority having been producers. Forty-one completions were recorded during the year, seven of which were dry. There is a producing area of about two square kilometers or 800 acres; the field having been very much extended to the south and southeast.

The outstanding feature in the development was the completion of well No. 52 in February for 2100 barrels at around 980 feet. Later, other wells of even larger initial production came in; however, the decline of the wells from flush to settled production has been rapid.

The completion of several dry holes in November in the southeastern part of the field, combined with unproductive wells to the west and northeast, would seem to indicate that the extent of the present shallow producing sands is pretty well defined, therefore, it is believed that unless deeper sands are developed the maximum production of this field has been reached.

There are three wells drilling; No. 92 was the last to be spudded in.

This company has commenced to drill a wildcat well on a separate structure at La Ceiba, south of the El Mene field.

La Paz and Concepcion Fields

The La Paz and Concepcion fields are located in the District of Maracaibo and lie west of the town bearing that name. During the year a 4 inch pipe line from La Paz to Concepcion and a 6 inch pipe line from Concepcion to Punta Piedras were completed; the first shipment of oil was made in July. The combined production of the two pools for the six months period is estimated to be 540,000 barrels, or a daily average of 3000 barrels.

At La Paz there are nine producing wells. This field is about 1½ kilometers long by ½ kilometer wide, extending in a north and south direction. Production is obtained from a sand series at depths ranging between 700 and 1000 feet. The production of the present wells is about 1500 barrels per day. There are two wells now drilling, P-No. 11 and P-No. 13. Well No. 12, the latest completion, came in early in January of 1926 with an initial daily flow of 1600 barrels, but will probably settle down to 400 or 500 barrels.

The Concepcion field, which is nearer the lake, has about 17 producing wells

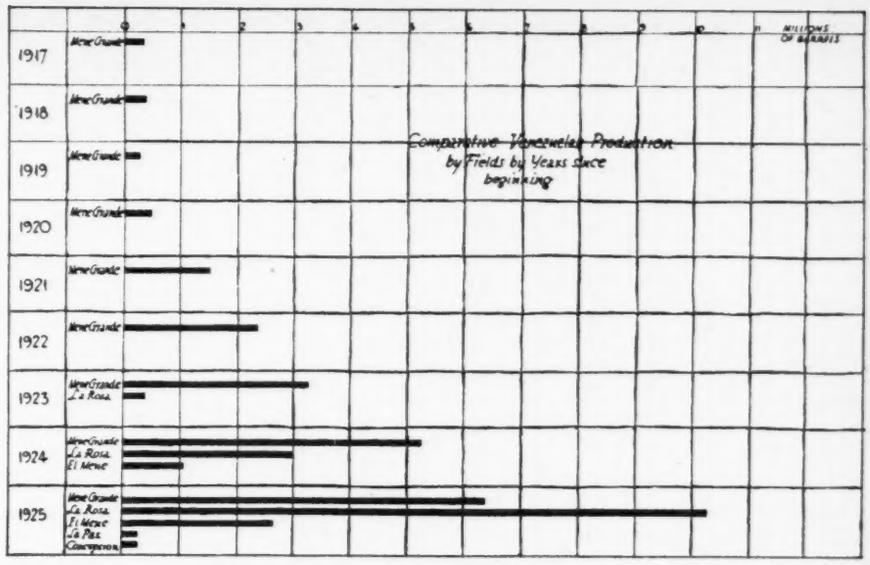

Figure No. 2

with a present daily production estimated to be about 2000 barrels. This field is proved for a distance of about five kilometers in length, extending in a northeast and southwest direction. The oil is produced from depths ranging between 900 and 1700 feet, and is of 37 to 38 degrees Be. One deep test is being made which, it is understood, has penetrated the Pauji shale but no production was developed in this formation. There were seven wells reported drilling at the end of the year; C-No. 24 having been spudded in the latter part of December.

The discovery of the Ambrosia producing area, located about 10 kilometers north of the La Rosa field, is the outstanding new development of the year. The discovery well, Lago Marine No. 1, located in the bed of Lake Maracaibo about three-eighths of a mile off shore, showed hot oil and gas under high pressure after drilling to a depth of 1378 feet in July. The importance of this area was confirmed in January, 1926, by the completion of two additional wells, the Rodriguez No. 2 of the Gulf, and Ambrosia No. 5 of the Lago, both of which came in around 1500 feet with an initial estimated daily production of 15,000 barrels each. Five more wells are being drilled in this area by the Gulf and Lago companies, and well locations have been made by the V. O. C. Ltd. on their offset acreage on the shore. The Gulf's deep test (Rodriguez No. 1) opposite Punta Leotea, south of Ambrosia and northwest of La Rosa, which was productive at a depth of 3752 feet, would seem to indicate that the area at Ambrosia will be a separate pool from that of La Rosa. The Ambrosia area promises to produce a large amount of oil and should be an important shipping field in 1926.

Drilling in the vicinity of the Guanoco asphalt lake in Eastern Venezuela by the New York & Bermuda Co. (General Asphalt Co.) has resulted in several flowing wells of low grade oil of about 10 degrees Be. from depths of around 800 feet; one well is reported to have produced 1700 barrels per day when drilled in. The total production from these wells during the year 1925 was about 50,000 barrels. It is estimated that the production from this field will give the company an average of 1000 barrels per day during 1926, the greater part of which will probably be used locally by the company in connection with its asphalt business.

Summary of Operations of Active Fields in Venezuela

Field	Wells drilling or rigging up 12-31-25	Wells completed in 1925 Producers	Dry	Approximate production in barrels for 1925	Number of producing wells	Gravity degrees Beaume	Age of Field Years	Estimated 1926 Production Barrels
Mene Grande	10	28	0	6,400,000	60	18	9	8,000,000
LaRosa-Ambrosia	25	71	0	10,300,000	85	21	3	23,000,000
El Mene	5	34	7	2,630,000	59	37	2	1,500,000
La Paz	3	6	0	265,000	9	28	1	800,000
Concepcion	6	17	0	275,000	17	37	1	1,000,000
Guanoco	2	3	0	50,000	4	10	1	350,000

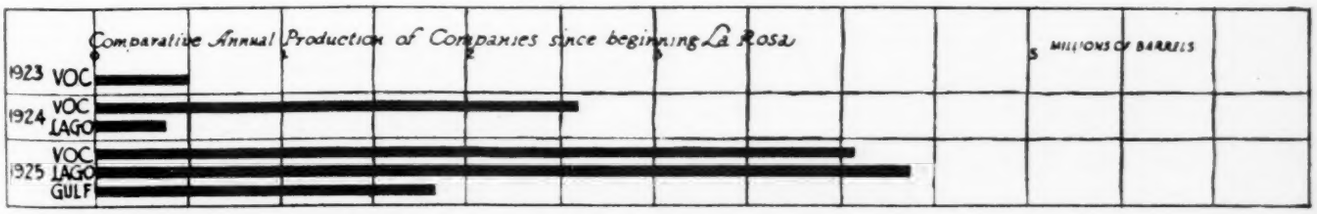
Comparative Annual Production of Companies since beginning La Rosa
MILLIONS OF BARRELS
1923 VOC
1924 VOC LAGO
1925 VOC LAGO GULF

Figure No. 3

In the District of Colon, the Colon Development Co. (Dutch Shell), has three wells drilling in the La Tarra field with no completion during the year. Well T.—No. 7, a deep test, has reached a depth of 3080 feet; T.—No. 10 and T.—No. 11 less than 1500 feet. This field has about 3000 barrels of shut-in production of 25 degrees Be. gravity. There is being erected one 67,000 barrel steel storage tank.

In the De Oro field the same company is drilling a semi-wildcat test about 12 kilometers north of the discovery well No. 2 on the Rio de Oro near the Colombian border. It is reported that this well has reached a depth of 1500 feet with important shows of both oil and gas.

In the territory west of Guanoco and north of Maturin, in the State of Monagas, Eastern Venezuela, the Standard Oil Co. of Venezuela carried on drilling operations in five wells, two of which have shown promise of producing small quantities of low grade oil similar to that produced at Guanoco; in both cases it is obtained from the Cretaceous formation. Additional well locations have been made by this company in this territory.

Considerable importance is attached to a heavy gas flow estimated at 75,000,000 cubic feet that occurred in December at a depth of 2626 feet in the La Danta well of the Standard Oil Co. of Venezuela, located in the central part of the District of Buchivacoa, State of Falcon, and about 50 kilometers northeast from El Mene, the nearest producing field. This company is drilling two other wells in this part of the State of Falcon.

At Pauji, southeast of the Mene Grande field, the New England Oil Corp., Ltd., is drilling one well and encountered oil producing sands at about 1700 feet. A location has been made for well No. 4. The Neogil well of this company, located south of the Mene Grande, has been taken over by the Richmond Petroleum Co. (S. O. of California) and will be deepened.

A showing of high grade oil was encountered at a depth of about 2800 feet in the Onia wildcat well of the Beacon-Sun Co. in the State of Merida, south of Lake Maracaibo.

At Lagunillas, south of the La Rosa field, the Gulf Co.'s No. 1 well, located on the Venezuela Petroleum Co.'s lake concession, was drilled to a depth of 2140 feet and reported to have encountered shows of oil. Heavy drilling equipment is being installed in order to drill the well deeper. Also, 10 kilometers east of this location, at El Mene-Lagunillas, the V. O. C. Ltd. is drilling one well and erecting a derrick for a second test.

The Palmarejo deep test of the Standard Oil Co. of Venezuela, in the District of Mara and north of the city of Maracaibo, has been drilled to a depth of about 4000 feet and encountered several important shows of gas.

In the District of Acosta, in the Eastern part of the State of Falcon, the North Venezuela Petroleum Co. is drilling its El Pozon well around 2500 feet, and another well nearer the coast at El Mene del Salta in this same district, which is now around a depth of 1000 feet.

The Omnium Oil Development Co., an English company, commenced a well in December with a diamond drill on their concession in the District of Urdaneta, south of the city of Maracaibo.

A derrick was erected in December by the O. C. Ltd., at Sibucara on a structure about five miles south of the city of Maracaibo.

The Gulf Co. is preparing to drill a well on parcel "Geneva" of the Creole Syndicate's lake shore concession, north of the city of Maracaibo.

Exploratory test holes drilled during the year for geological purposes consisted of 20 by the Beacon-Sun Co. along the La Ceiba R. R. right of way in the State of Truillo, and along the Boscan auto road in the District of Sucre; 9 by the Texas Co. in the Districts of Urdaneta and Perija; and 3 by the Gulf Co. in conjunction with the Orinoco Oil Co. (Pure Oil Co.) in the District of Mara.

The Richmond Petroleum Co.(S. O. of Cal.) has portable rigs ready to start test holes in the Districts of Urdaneta and Sucre.

Marine

A considerable number of shallow draft tankers were added to the fast growing fleets of the Dutch Shell, Lago Petroleum & Transport Co. and Venezuelan Gulf Oil Corp. At present there are about 40 of these tankers with a capacity ranging from 6,000 to 17,000 bbls. each that are capable of moving about 80,000 bbls. per day to the deep-sea transfer points outside of Lake Maracaibo, namely, Curacao, Aruba, (Dutch Islands) and Paraguana on the north of Venezuela. The Dutch Shell Co. and the Gulf Co. have under construction in England, 11 of the latest type tankers, 8 and 3 respectively, which, together with the additional tankers the Lago Co. will put into service, could provide for an average movement of about 100,000 barrels per day throughout the year.

Land Transactions

Land transactions have continued active. Considerable interest has been taken in the eastern part of Venezuela especially in the States of Monagas, Anzoategui and Guarico, where several million acres have been acquired through the transfer of exploration concessions; the Gulf Co. and the Richmond Petroleum Co. were the largest buyers. It is generally believed that this territory will not likely experience any drilling activity for another two or three years, or until the companies will have an opportunity to complete their surveys and present their maps to the government for approval.

The Compania Venezolana de Petroleo, a Venezuelan company, sold several hundred thousand hectares of Federal Reserve lands in the Lake Maracaibo Basin region and in Eastern Venezuela to American and English interests which are now in the process of transfer.

Of special interest are the following company transactions: (1) The entrance of the Standard Oil Co. of Indiana into the Venezuela through the purchase of the controlling interest in the Lago Petroleum Corp. by the Pan-American Petroleum & Transport Co. in which it has a large interest; (2) the purchase, during the later part of the year, of the Central Dutchivacoa District of the State of Falcon by the Standard Oil Co. of Venezuela (S. O. of N. J.) from English interests; (3) the closing of contracts by the Richmond Petroleum Co. (S. O. of Cal.) to drill acreage of the New England Oil Corp. Ltd., and Venezuela Petroleum Co., and an operating agreement with the Beacon-Sun Co. to develop jointly their acreage in the District of Democracia, State of Falcon; (4) the approval by the Venezuelan Congress in July of a new contract covering the rights of the V. O. C. Ltd. in the Districts of Bolivar and Maracaibo; one of the considerations being the payment to the Venezuelan government of $2,000,000.

Production In 1926

It is believed that for the year 1926 Venezuela will not maintain its record of doubling production as heretofore for the reason transportation facilities, principally lake tankers, will probably not be furnished rapidly enough to take care of such an increase. The total production for the year 1926 as estimated will be 30,000,000 to 35,000,000 bbls.

Trinidad

With the exception of Cuba, which produced a small amount of petroleum, Trinidad is the only island in the West Indies that experienced any oil field development in 1925. Trinidad has maintained a steady increase in the production of oil during the last three years, and a corresponding increase in the footage drilled but during the year 1925 only 80,000 ft. were drilled as compared with 152,000 ft. in 1924, as shown below. This decrease in footage drilled, while production increased, is principally accounted for by drilling activities being confined to proven fields.

	1922	1923	1924	1925
Feet Drilled	135,870	145,801	151,892	80,000
Production, Bbls	3,444,752	3,050,872	4,056,612	4,306,522

The greater part of the production in 1925 was derived from the several fields lying south of the famous Pitch Lake in the southwestern part of the island; the most important of which are: The Fyzabad and Forest Reserve fields operated by the Trinidad Leaseholds Ltd. and associated companies; Parryland, Point Fortin and lot 1, 4 and 5 fields operated by the United British Oilfields of Trinidad Ltd., and others; and the Brighton and Vessigny fields operated by the Trinidad Lake Petroleum Co. (General Asphalt).

New Grade Of Coastal Crude Appears; West Texas Wildcats Watched

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Feb. 15

INCREASINGLY higher gravities of crudes produced in the Gulf Coastal Texas district have resulted in the establishment of a third buying classification. Previously, the grades were known only as "A" and "B," the first prized highly for its lubricant values and the second mainly utilized for fuel purposes.

"A" grade crude, currently taking a posted price of $1.50 a barrel at the well, grades approximately as follows, the requirements of different purchasers varying slightly:

Viscosity—Not less than 100 seconds at 100 degrees F. (Saybolt).

Sulphur—Not more than .4 per cent.

Beaume Gravity—Not more than 24 degrees at 60 degrees F.

Cold Test—Of distillates having viscosity of 100 seconds at 100 degrees F. shall not be over 5 degrees F., A.S.T.M. method.

Until inauguration of the new schedule by The Texas Co., which so far has affected only production at Sour Lake and Boling, all Coastal crudes which failed to meet specifications for "A" grade were classified as "B" grade.

Using Mid-Continent Schedule

Now the Texas Co. is buying the exceptionally high gravity oils found at Boling and in the deep flank well of the Yount-Lee Oil Co., at Sour Lake, on a "light oil schedule" conforming to the Mid-Continent gravity scale. The Boling oil, which so far is confined to The Texas Co's. own flank discovery, approximates 32 degrees gravity, having a posted value for that grade of $1.72 a barrel at the well. Oil from the Yount-Lee well tests about 34 gravity, and on that basis commands $1.88 a barrel.

At Piedras Pintas, in Duval county, where the Humble Oil & Refining Co's. east flank discovery well tests approximately 43 degrees gravity, royalties are being paid on a basis of $1.75 a barrel for the crude. This oil shows nearly 90 per cent light fractions in refinery distillation, from gas oil up to heavy naphthas.

Other purchasing agencies have failed so far to post prices corresponding to The Texas Co's. new Coastal light oil schedule, but there is no material competition at present to call for their inaugurating similar schedules.

Humble produces and handles its own crude at Piedras Pintas and The Texas Co. similarly deals with present Boling production. The Yount-Lee oil at Sour Lake constitutes the only outside purchasing now being made, but the further development of the Boling salt dome (now under way) promises to give that field a price distinction in a more general sense of the word.

The Gulf Coastal area now is in a position of having an "off" grade crude previously called "light," which was despised for lubricant values and which was known as "B" grade, still taking a price differential 25 cents a barrel under "A." Now still lighter oils, which yield volatile fractions under special treatment, take on equivalent Mid-Continent crude values.

Wildcatting in the West Texas region, which pivots on territory outlying from two partially developed fields, continues to be followed with wide interest. The exploratory work being carried forward in all directions from the Big Lake field, in Reagan county, and the Westbrook field, in northern Mitchell county, has resulted in many small shows of oil but none definitely proved to have opened a field of major proportions.

The World well prospect, in northern Crockett county, 16 miles south and a little east of the Big Lake field, now has its fourth well at the completion stage. This is the Cromwell et al test, taken over from Wade & Bryant, about a quarter of a mile southeast of the Powell discovery which made about 30 barrels, initial production, last June.

Neither the Cromwell well nor others drilled closer to the discovery by the Humble-Marland partnership proved to have greater initial value than the original completion. The last mentioned well was completed by the Chester R. Bunker et al interests (World Oil Co.) and sold, with additional acreage, to the Humble Oil & Refining Co., and the Marland Oil Co. of Texas at the time of its discovery last June.

One of the two Powell wells drilled by the Humble-Marland partnership is being deepened for a test of possible production at a lower depth than the 2650 foot horizon now making its nominal yields.

Tulsans Get Gas Flow

About sixteen miles south of the World well prospect, in sec. 50, a test of J. C. Cooke et al (H. F. Wilcox Oil & Gas Co. interests of Tulsa) got an 8,000,000 cubic foot flow of gas in a lime break at 1700-1704 feet. The rig burned down when the gas blew out and the test has not yet been resumed.

A short distance east of the Cooke gasser, the Republic Production Co's. test on the Todd ranch had an oil showing at approximately the 1700 foot level some time ago.

West of Hurdle, in southwestern Upton county, a third test is now showing oil. It is the Independent Oil & Gas Co's. No. 1 Burleson, 1000 feet east of the Johnson & Camey discovery on the Baker land. The Independent's well, in sec. 100, had the pay at about 2170 feet, the approximate depth from which the McCamey & Johnson (now Republic Production Co.) well is averaging 55 barrels daily. The Independent test is standing with a few hundred feet of oil in the hole.

Approximately six miles east, and within a mile of the town of Hurdle, on the Kansas City, Mexico & Orient railroad, the Plateau Oil Co., and others, drilling on Union Land Co. acreage, had oil in lime formation at 2206-2234 feet. Oil rose in the hole 1000 feet after a shot.

Operations Toward Westbrook

Northeasterly across Upton, Glasscock and a part of eastern Howard county, attention continues to be given shows found in wildcatting operations away from the old Westbrook field of northwestern Mitchell county.

The Fred Hyer No. 1 Clay well, the completion of which was reported for southeastern Howard county some time ago, pumped an average of 9¾ barrels at 1557 feet in January. The No. 1 Scott-Hyman of the Deep Rock Oil Co. (Schaffer Oil & Refining Co.), near the Glasscock-Howard county line, swabbed 8 barrels daily at 2780 feet, was drilled to contract depth of 3300 feet and may be put on down for a deeper test.

Magnolia Petroleum Co.'s Iatan discovery, on W. L. Foster land, has been followed by the completion of a second well, offsetting it on the south.

The discovery well, which made a maximum of 192 barrels daily after completion last August, is still good for more than 100 barrels daily in sandy lime at 2873 feet. It is in the center of the south line of sec. 17, block 29, Texas & Pacific railroad survey.

The second completion, in sec. 20, found a tight phase of the lime horizon at the approximate depth of the discovery well and was good for only about 20 barrels daily at that level. It was drilled on down to 3176 feet, where it was completed for 60 barrels daily in a second pay horizon.

In the southern tip of Texas, where a number of Laredo district pools follow the foot of an escarpment across Webb and Zapata counties, a fresh discovery has been made by the Cintex Oil Co. The well is in the heart of the old Cole gas field, approximately due east of the Miranda City pool about 16 miles.

The well came in for oil at 1787 feet, below the level of the gas horizon, and started off with "big head" over the crownblock. It then settled down to a smaller production, rating at about 1500 barrels, initial yield, daily.

Type A

Type No. 24

Standardize on One of These Two Tank Faucets

HERE are two Wheaton tank faucets, both of which give 100% satisfaction. Some companies standardize on Type A while others standardize on Type 24. Each faucet has only one peer—*and that's the other!* More important than a choice between them is a definite and final decision to *standardize* on one, and then forget for all time that there is any other faucet.

A. W. WHEATON BRASS WORKS, NEWARK, N. J.

Wheaton

Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

Gasoline Shipments are Increased; Stocks Grow More Slowly

Special Wire Service

TULSA, Feb. 16

SHIPMENTS of gasoline increased 12 per cent or 3,000,000 gallons in the week ended Feb. 12, according to reports gathered by National Petroleum News from 124 Mid-Continent refineries. As a result of the better movement of motor fuel gasoline stocks increased less than 1,000,000 gallons for the first time in the past two months. Stocks on Feb. 12 at all reporting plants amounted to 85,951,988 gallons representing 21 days supply at the rate of shipment maintained during the week.

Crude runs at all plants were increased 16,000 barrels per day to 246,197 barrels. This is about 3,000 barrels below the January average of 249,000 barrels. Oklahoma refiners increased their daily average runs 10,000 barrels but the increases in other states were small.

Fuel oil stocks were reduced more than 5,000,000 gallons to 96,613,329 gallons when shipments were increased 3,000,000 gallons to 31,992,548 gallons. Every group in the field participated in the increased demand for fuel. Gas oil shipments fell off sharply, however, and stocks were increased 1,370,000 gallons.

Refiners increased their production of kerosene 13 per cent or 600,000 gallons but shipments climbed 15 per cent so that the steady drain on stocks continued bringing the total on Feb. 12 to 7,696,000 gallons. Distillate stocks were reduced as usual by more than 1,000,000 gallons to 6,484,461 gallons.

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Feb. 12. Change in stocks figured from Jan. 15.

	Gallons
Gasoline	
Production	118,364,097
Shipments	104,944,417
Net change in stocks	—275,417
Ratio sales to production	88.7%
Kerosene	
Production	20,928,137
Shipments	21,203,554
Net change in stocks	275,417
Ratio sales to production	101.3%
Stove Distillate	
Production	6,660,345
Shipments	12,291,910
Net change in stocks	—5,631,565
Ratio sales to production	184.6%
Gas Oil	
Production	24,556,372
Shipments	30,051,420
Net change in stocks	—5,495,057
Ratio sales to production	122.4%
Fuel Oil	
Production	106,581,070
Shipments	115,905,327
Net change in stocks	9,324,257
Ratio sales to production	—108.7%

Mid-Continent Refinery Operations Week Ended Feb. 12 (By Fast Wire)

	Kansas	%Change Previous Week	Oklahoma	%Change Previous Week	No. & Cent. Texas	%Change Previous Week	No. La.-Ark.	%Change Previous Week	Total	%Change Previous Week	Totals Week Ended Jan. 15
Plants Reporting	23		46		41		14		124		124
Da. Cap. (Bbls.)	98,200		165,900		144,300		51,900		460,100		460,100
Da. Av. Crude Runs.	46,966	+ 2.7	102,111	+10.9	56,733	+ 7.7	40,387	+ 1.8	246,197	+ 6.9	249,998
Da. Av. Other Oils	1,408	— 7.9	—631	.....	4,631	+651.8	365	+60.8	5,773	—12.8	7,622
GASOLINE—Gallons											
Stocks Feb. 5	11,979,070		51,282,372		17,479,247		4,218,364		84,959,053		70,933,573
Prod. 2-5 to 2-12	7,190,895	+ 8.3	13,470,448	+ 6.4	6,269,799	+16.3	2,695,497	— 0.1	29,626,639	+ 8.2	30,508,237
Ship. 2-5 to 2-12	7,780,092	+ 1.5	12,856,442	+25.9	5,949,145	+17.6	2,048,025	—22.9	28,633,704	+11.9	28,909,502
Stocks Feb. 12	11,389,873	— 4.9	51,896,378	+ 1.2	17,799,901	+ 1.8	4,865,836	+15.3	85,951,988	+ 1.2	72,532,308
Ratio Sales to Prod.	108.2%		95.4%		94.9%		76.0%		96.6%		94.8%
KEROSENE—Gallons											
Stocks Feb. 5	1,376,295		4,861,005		1,591,494		385,344		8,214,138		9,180,950
Prod. 2-5 to 2-12	1,014,131	— 2.8	2,545,566	+ 9.4	1,266,624	+39.9	515,290	+18.1	5,341,611	+13.4	5,081,555
Ship. 2-5 to 2-12	1,225,721	+11.6	2,378,835	— 3.2	1,546,786	+83.8	437,407	— 6.6	5,588,749	+14.9	6,020,088
Stocks Feb. 12	1,164,705	—15.4	5,027,736	+ 3.4	1,311,332	+17.6	463,227	+20.2	7,967,000	— 3.0	8,242,417
Ratio Sales to Prod.	120.9%		93.4%		122.1%		84.9%		104.6%		118.5%
STOVE DISTILLATE—Gallons											
Stocks Feb. 5	2,011,764		4,968,509		532,871		40,866		7,554,010		13,479,736
Prod. 2-5 to 2-12	696,822	—22.8	660,350	+43.9	486,598	+94.3	21,126	—25.9	1,864,896	+13.7	1,476,021
Ship. 2-5 to 2-12	1,023,837	—22.2	1,243,494	—28.1	630,269	+21.4	36,918	+20.2	2,934,445	—18.4	2,839,731
Stocks Feb. 12	1,684,749	—16.3	4,385,465	—11.7	389,173	—27.0	25,074	—38.6	6,484,461	—14.2	12,116,026
Ratio Sales to Prod.	146.9%		188.3%		129.5%		174.8%		157.4%		192.4%
GAS OIL—Gallons											
Stocks Feb. 5	3,303,843		32,235,800		6,965,544		6,253,055		48,758,242		55,360,518
Prod. 2-5 to 2-12	1,292,504	+22.9	2,400,246	+ 5.4	129,750	—21.9	2,051,225	+ 9.9	5,773,725	+ 9.6	5,893,286
Ship. 2-5 to 2-12	865,542	—37.5	876,981	—44.4	488,994	—79.9	2,270,096	+19.3	4,501,613	—38.3	5,628,393
Stocks Feb. 12	3,730,805	+12.9	33,759,065	+ 4.7	6,606,300	— 5.2	6,034,184	— 3.5	50,130,354	+ 2.8	55,625,411
Ratio Sales to Prod.	67.0%		36.5%		376.9%		110.7%		76.6%		95.5%
FUEL OIL—Gallons											
Stocks Feb. 5	11,879,765		50,281,259		24,649,108		14,912,282		101,722,414		103,498,551
Prod. 2-5 to 2-12	4,238,560	— 4.8	8,622,496	+11.2	7,895,909	+ 5.3	6,126,498	+ 2.3	26,883,463	+ 4.6	28,337,109
Ship. 2-5 to 2-12	4,697,403	+ 9.7	10,969,403	+18.6	9,058,866	+ 6.3	7,266,498	+ 8.6	31,992,548	+11.3	25,898,074
Stocks Feb. 12	11,420,922	— 3.9	47,934,352	— 4.7	23,486,151	— 4.7	13,771,904	— 7.6	96,613,329	— 5.0	105,937,586
Ratio Sales to Prod.	110.8%		127.2%		114.7%		118.6%		119.0%		91.4%

Crude Production by Districts

Daily average gross crude output of United States, by fields, for week ending with dates given below, as compiled by American Petroleum Institute

National Petroleum News

OKLAHOMA

	Feb. 13	Feb. 6
North Braman	2,700	3,050
South Braman	7,950	8,000
Blackwell	3,400	3,200
Hubbard	2,200	2,150
Thomas	10,200	13,600
Tonkawa	42,350	43,300
Garber	27,200	21,950
Burbank	44,850	44,450
Osage, outside Burbank	33,150	33,800
Watchorn	2,900	2,850
Cushing	22,600	22,700
Yale Jennings	11,350	11,450
Davenport	19,850	19,900
Bristow-Slick	32,150	31,600
North Okmulgee	18,550	18,650
Lyons-Deaner	4,300	4,300
Stroud	2,700	2,600
Cromwell	20,050	19,950
Papoose	15,350	14,650
Wewoka	14,100	13,700
Duncan district	7,500	7,500
Graham	9,250	9,200
Fox	3,500	3,650
Healdton	14,950	14,950
Hewitt	12,600	12,600
Others	63,300	62,000
Total Oklahoma	449,000	445,750
Increase		3,250

KANSAS

	Feb. 13	Feb. 6
Florence-Covert	2,000	2,000
Peabody-Elbing	4,950	4,900
Eldorado-Towanda	14,300	14,300
Augusta-Fox-Bush	5,000	5,000
Rainbow Bend	5,050	5,250
Russell	5,400	5,450
Others	64,550	63,750
Total Kansas	101,250	100,650
Increase		600

NORTH TEXAS

Burkburnett	12,400	12,500
Electra	16,350	16,200
Iowa Park and K-M-A	5,400	5,450
Wilbarger	11,400	11,350
Panhandle	3,100	2,900
Petrolia	400	400
Archer County	26,900	27,700
Others	900	900
Total North Texas	76,850	77,400
Decrease		550

EAST CENTRAL TEXAS

Mexia	13,250	13,500
Currie	1,050	1,100
Richland	2,500	2,550
Corsicana-Powell	32,100	32,300
Wortham	10,950	11,250
Total East Central Texas	59,850	60,700
Decrease		850

WEST CENTRAL TEXAS

Stephens County	12,650	12,600
Eastland County	5,850	6,100
Desdemona	2,050	2,050
Young County	7,850	8,150
Palo Pinto County	400	400
Callahan County	4,450	4,400
Shackelford County	2,300	2,300
Reagan County	29,300	30,200
Others	5,050	5,150
Total West Central Texas	69,900	71,350
Decrease		1,450

NORTH LOUISIANA

Homer	5,900	5,700
Haynesville	10,400	11,350
Caddo, light	8,850	8,750
Caddo, heavy	2,350	2,300
De Soto, Red River	3,900	3,800
Elm Grove	550	600
Bellevue	2,350	2,300
Others	950	1,100
Cotton Valley	8,150	8,400
Total North Louisiana	43,400	44,300
Decrease		900

ARKANSAS

El Dorado	7,600	7,300
Smackover, light	19,200	19,000
Smackover, heavy	140,200	142,000
Stephens	1,500	1,650
Nevada	1,650	1,700
Total Arkansas	170,150	171,650
Decrease		1,500

SOUTHWEST TEXAS

	Feb. 13	Feb. 6
Luling	20,850	20,700
Mirando	5,600	5,800
Somerset	2,200	2,250
Lytton Springs	7,050	7,150
Others	1,300	800
Total Southwest Texas	37,000	36,700
Increase		300

GULF COAST

Goose Creek	8,500	8,600
Hull	15,450	15,200
Saratoga	1,250	1,300
Blue Ridge	900	900
Damon Mound	1,000	1,000
Batson	1,100	1,150
West Columbia	9,000	9,050
Humble	4,750	4,700
Pierce Junction	1,300	1,350
Sour Lake	4,800	4,850
Spindletop	5,350	6,150
Orange County	13,300	13,250
Edgerly	600	600
Evangeline	1,050	1,050
Vinton	6,500	6,550
Lockport	1,550	1,750
South Liberty	7,750	7,850
Big Creek	950	950
Boling	4,250	4,300
Others	1,600	1,000
Total Gulf Coast	90,950	91,550
Decrease		600

ROCKY MOUNTAIN

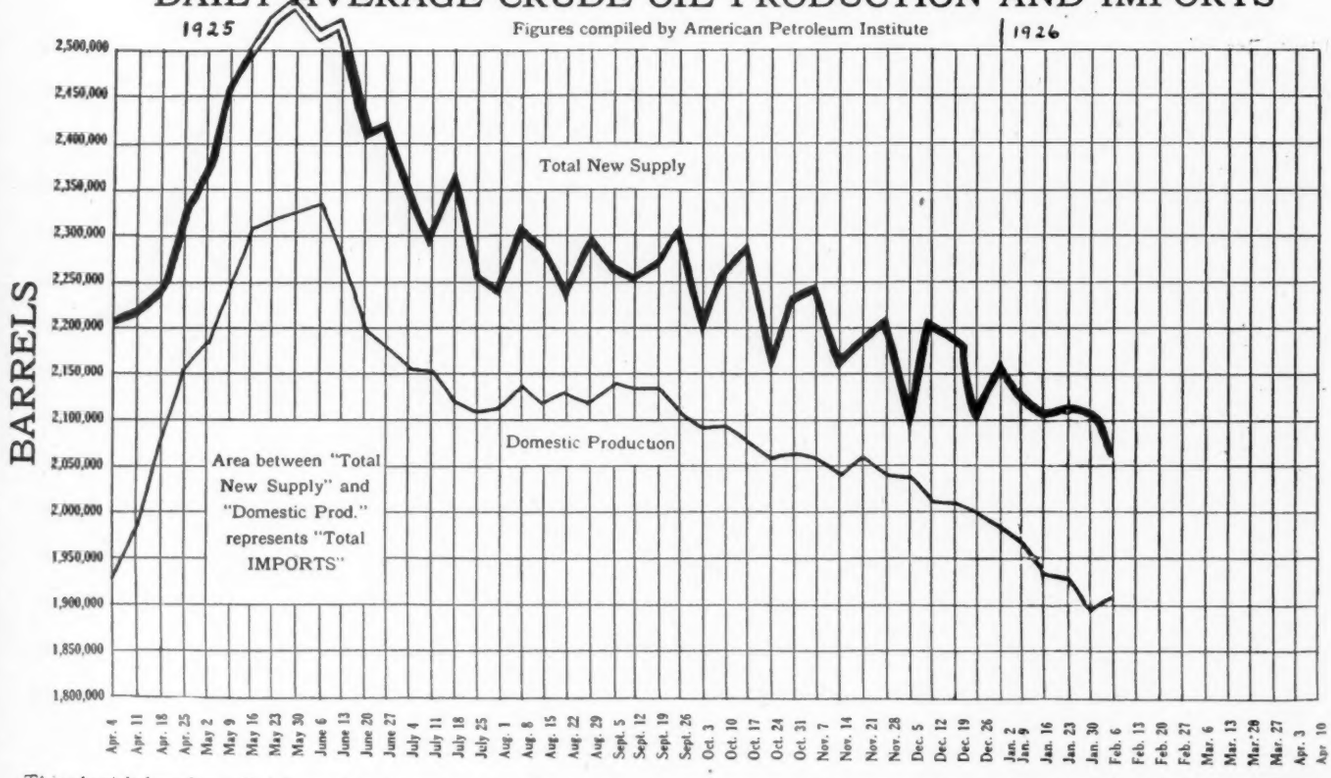
WYOMING

	Feb. 13	Feb. 6
Salt Creek	55,350	56,000
Grass Creek	2,800	2,850
Elk Basin	650	600
Big Muddy	3,400	3,450
Lost Soldier	4,150	3,850
Rock River	2,950	3,000
Teapot Dome	1,700	1,450
Others	4,350	4,650
Total Wyoming	75,350	75,850
Decrease		500

(Continued on page 44)

DAILY AVERAGE CRUDE OIL PRODUCTION AND IMPORTS

Figures compiled by American Petroleum Institute



This chart is based on official complete figures of A. P. I and is a week older than the production estimates given in regular tabular form above.

"OILWELL" ESTD. 1862 TRADE MARK. (REGISTERED)

A FEW "OILWELL" SPECIALTIES

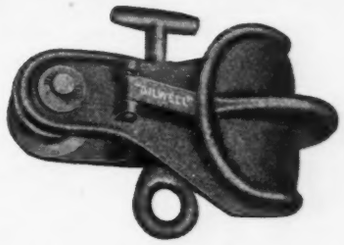
"OILWELL" ESTD. 1862 TRADE MARK. (REGISTERED)

The G. H. & H. Jar Down Wire Rope Knife is complete in itself—it does not require any extra set of jars or bumper, and there are no joints to become unscrewed.

It has a ball bearing swivel top, and will cut wire line within one-half inch of the rope socket neck.

The parts are few in number, extra strong, and readily accessible.

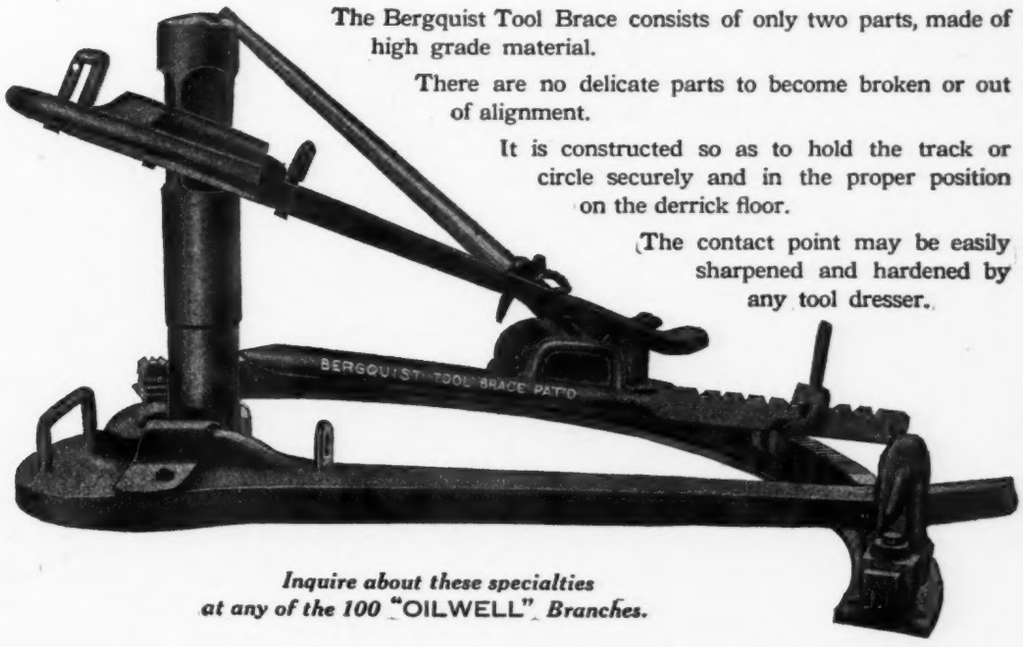
It is made entirely of steel.



The G. & H. New Style Wire Line Spudding Shoe is strong, durable and easy to handle.

It is equipped with a safety device which eliminates danger to workmen, and the design insures longer life for the jerk line.

Made of cast steel. Is safe, sure and satisfactory.



The Bergquist Tool Brace consists of only two parts, made of high grade material.

There are no delicate parts to become broken or out of alignment.

It is constructed so as to hold the track or circle securely and in the proper position on the derrick floor.

The contact point may be easily sharpened and hardened by any tool dresser.

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OIL WELL SUPPLY CO.

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WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

(Continued from page 42)

MONTANA

Cat Creek	3,100	3,050
Sunburst	9,050	9,100
Total Montana	12,150	12,150

COLORADO

Moffat (Craig)	3,750	3,150
Fort Collins	2,400	2,400
Florence	400	400
Others	450	450
Total Colorado	7,000	6,400
Increase		600

NEW MEXICO

Artesia	3,200	3,450
Hogback	550	500
Rattlesnake	400	350
Total New Mexico	4,150	4,300
Decrease		150
Total Rocky Mountain	98,650	98,700
Decrease		50

CALIFORNIA

	Feb. 13	Feb. 6
Santo Fe Springs	47,000	47,000
Long Beach	112,500	112,500
Huntington Beach	44,500	44,500
Torrance	28,500	29,000
Dominguez	23,000	23,000
Rosecrans	22,000	21,500
Inglewood	56,000	56,000
Midway-Sunset	92,000	92,000
Others	181,000	182,500
Total California	606,500	608,000
Decrease		1,500

EASTERN

(Including Ill., Ind., Ky., Ohio, W. Va., Pa., and N. Y.)	99,000	99,500
Decrease		500

Production Summary

Production east of Rokies	1,296,000	1,298,250
Decrease		2,250
Total Production in U. S.	1,902,500	1,906,250
Decrease		3,750

Helling Loses Daughter

TULSA, Feb. 15.—J. A. Helling manager of the El Dorado Refining Co., El Dorado, Kan., lost his 2½ year old daughter, Betty Lou on Feb. 5. The child died as a result of influenza complicated by pneumonia. She is survived by Mr. and Mrs. Helling and two sisters.

Crude Changes

Feb. 13. — Joseph Seep Purchasing Agency advanced all Pennsylvania grade crude 25 cents, excepting Macksburgh, O. district which was advanced 35 cents, and Gaines, which was unchanged. It also advanced Cabell, Somerset medium and Somerset light 10 cents. New prices are: Bradford district in National Transit lines, and Allegany district in New York Transit Lines, $3.90; other Pennsylvania grade in National Transit lines and Southwest Pennsylvania Pipe lines, $3.80; West Virginia oil in Eureka Pipe lines, $3.75; Macksburg, O. district in Buckeye Pipe lines, $3.65; Cabell, $2.20; Somerset medium, $2.30; and Somerset light, $2.45.

Feb. 15.—Joseph Seep Purchasing Agency posted Keister grade oil, in National Transit Lines, at $2.45. This is a heavy grade oil in Butler county, Pa.

Sustains Conspiracy Indictments

WASHINGTON, Feb. 16.—Justice Stafford of the District of Columbia Supreme Court yesterday sustained the validity of the conspiracy indictment against Albert B. Fall, former secretary of the Interior, E. L. Doheny and H. F. Sinclair in connection with the leases granted the two last named on the naval oil reserves in California and Wyoming.

The court overruled demurrers filed by the defendants and held that, while, as set forth in the demurrer, Fall may have had no authority to make the contracts in question, it felt that it should hold the indictment valid on the ground that a conspiracy to defraud the United States through interference with governmental function and operations was sufficient ground upon which to found the indictments.

This means that Fall, Sinclair and Doheny will have to stand trial in the District of Columbia courts on the conspiracy charge unless a higher court takes jurisdiction and holds the trial up until it can pass upon this or some other point of law.

BULLETIN

By Fast Wire

HOUSTON, Feb. 15.—Existence of a deeper pay horizon in southwestern Upton county is proved by Kirby Petroleum Co.'s No. 1 Union Land Co. test in Sec. 51, upwards of a mile south of the Johnson and McGamey discovery that was sold to the Republic Production Co. after the Kirby test failed to get the 2270-foot pay of the discovery well it was drilled on down to 3015 feet where seven feet of oil saturated lime was found above a water horizon. At present depth of 3045 feet the Kirby well stands full of black sulphur water. Although individually unfavorable, the Kirby test is important as indicating second pay production at points where the lime thickens in structurally high places elsewhere in the adjacent territory.

Near Hinkles Ferry, in the J. McNeel Survey, about five miles south of the town of Brazoria, in Brazoria county, the Roxana Petroleum Corp. has found another Gulf Coastal salt dome. Its No. 1 Kropp test found oil sand at 541 feet and now is drilling in cap rock pay between that level and 600 feet with certainty of making some kind of well.

Gasoline Manufacturers To Meet May 5 and 6

TULSA, Feb. 15.—The annual convention of the Association of Natural Gasoline Manufacturers will be held in Tulsa on May 5 and 6, it was announced today by A. V. Bourque, secretary. Convention headquarters will be at the Mayo hotel.

Ordinarily the gasoline manufacturers hold their convention in April but it was found impossible to arrange a suitable time in that month without conflicting with other conventions.

L. F. Bayer, general manager of the Tidal Refining Co., is chairman of the program committee for the convention. Other members are A. M. Ballard, Sun Oil Co., and G. G. Oberfell, Phillips Petroleum Co.

At a recent meeting of the executive committee of the association a publicity committee was appointed to include D. E. Buchanan, vice-president of the Chestnut & Smith Corp., as chairman, and Mr. Bayer, Mr. Oberfell, Mr. Bourque and H. R. Johnson of the Akin Gasoline Co.

No Water In Oil Sand In Kansas Wildcat

TULSA, Feb. 16.—D. P. Fleeger, of Wichita, Kans., owner with the Carter Oil Co. of the Kingman County, Kans., wildcat well which added another to Kansas' list of oil producing counties, was in Tulsa during the past week on business. He states the well made as high as 1160 barrels per day, and that tests have shown that there is no water in the sand as far as it has been drilled. Reports current shortly after the well came in were to the effect that the well was making water, but this water came from higher up in the hole and has now been shut off.

The well, which is located in the NEc SE of 16-27-7w on a block of 560 acres found the gas sand from 3860 to 3892 feet, making three million cubic feet, while the oil was found one foot deeper at 3893 feet. The oil sand was drilled into on Jan. 26. The well drilled itself in, having shown a small spray of oil when it started making gas. Gravity of the crude is 34.2, with high gasoline content and no sulphur, according to refining analyses, Mr. Fleeger says.

Fleeger and associates are moving in material for a test five and a half miles southeast of the discovery well, and will drill to 4000 feet, if necessary. This well, known as No. 1 Greenleaf, will be located in the NEc of 13-28-7. In the NWc of 7-26-7, Hopper et al. are drilling below 2700 feet in their No. 1 Fields, after finding about one million feet of gas at 2680 feet. Three previous wells on this farm have been abandoned on account of bad fishing jobs, all of them having found this gas.

Geologists to Convene

DALLAS, TEX., Feb. 16.—The eleventh annual convention of the American Association of Petroleum Geologists will be held at The Baker Hotel, Dallas, on March 25, 26, and 27, according to R. E. Rettger, a member of the publicity committee.

TULSA, Feb. 13.—E. H. Salrin, vice-president of the Tidal Oil Co., spent the past week in Amarillo, Tex., looking over the oil development there. He was accompanied by J. H. Jenkins, Texas manager, who maintains his headquarters in Fort Worth.

Wisconsin Markets Board Expected To Nullify Quantity Discounts

By Ward K. Halbert
N. P. N. Staff Writer

Staff Special
MILWAUKEE, Feb. 15

A RULING by the Wisconsin department of markets throwing a wrench into the machinery of the Standard Oil Co.'s quantity discount agreements is almost assured. A ruling has not been issued but the handwriting on the wall is so plain that it can not easily be misunderstood.

Oil men, attorneys, and other interested spectators ceased to wonder what the outcome of the investigation would be, at least two days before it terminated. What the Standard Oil Co. will do, is all that is left to guess.

It is expected the Wisconsin department of markets will order into effect its proposed general order 25 which would nullify the Q. D. A. Consensus of opinion is that the Standard will seek to enjoin the department from putting the order into effect. The question then would have to be threshed out in court.

The investigation of the Q. D. A. ended Feb. 11 in Milwaukee after four days' hearings. Stenographers have bundles of exhibits and books full of shorthand notes to transcribe. On this voluminous collection of data the Q. D. A. will stand or fall in Wisconsin.

Three Bits of Information

The investigation has developed three outstanding pieces of information from the testimony drawn from jobbers, consumers, purchasing agents and other witnesses. They are:

1. There are two kinds of quantity discount agreements, viz., the tank wagon Q. D. A. and the service station Q. D. A., and they are not alike in principle or method of operation.

2. Independents, with few exceptions, say they have lost gallonage by virtue of the service station Q. D. A. because their territory is limited and they can not serve the motoring representatives of national companies, industrial and commercial.

3. A few of the larger Independents, who cater to the industrial trade, testify that the profit has been drained from their preferred business because 2 cents a gallon is too much of an inducement to offer a big buyer under existing close market conditions. Even the most desirable tank wagon accounts are not profitable at the regular Q. D. A. discount.

W. A. McMillan's Figures

In discussing the third point, the testimony of W. A. McMillan of Lindsay-McMillan Co., Milwaukee, presented Thursday afternoon, is most enlightening. It is especially important because that company caters to big accounts and has an accounting system that permits the executives to know, almost from day to day, what the costs and profits of operation are. In brief, Mr. McMillan's statement to the commissioner was this:

"The average week-to-week refinery price of U. S. Motor gasoline in Group 3, as shown in National Petroleum News, plus freight to Milwaukee, shows an average delivered price here of 13.41 cents a gallon over 1925. The average tank wagon price in Milwaukee as shown by the same publication was 17.05 in 1925. That leaves an average working margin of 3.64 cents on tank wagon business in Milwaukee last year. But our accounting department shows that the actual handling charge of gasoline delivered by tank wagon in 1925 was 3.4 cents a gallon. In other words, our net profit on tank wagon business was 0.24 of a cent a gallon. How can we afford to cut our price 2 cents a gallon to obtain such business?"

Mr. McMillan testified that his company had lost gallonage to the Standard Oil Co. on the tank wagon Q. D. A., not because they were not meeting the Standard's discount but because they were not ready to meet it when the Standard first offered it. In other words, the Standard brought out the Q. D. A. as a surprise to the Independents and got some desirable business with it before the Independents could prepare to meet it. He and others also testified that the use of contracts had added to, rather than lowered, their sales expense.

Wadhams Oil Co., one of the oldest and largest Independent oil marketers in America, is generally looked upon as second to Standard Oil Co. in volume of business in Wisconsin. H. W. Dodge, its vice president in charge of marketing, expressed the opinion that Q. D. A. will add to the cost of gasoline to everybody because it is an additional overhead burden to operation—by no means an economy.

Mr. Dodge testified that Wadhams Oil Co., from July 1 to Dec. 31, 1925, paid $43,152 in rebates, meeting the Standard Oil Co.'s quantity discount offers, and stated that that amounted to roughly ⅓ cent a gallon on all the gasoline the company handled in that time. Wadhams has held numerous large industrial accounts, Swift and Armour packing companies among them. Herman L. Ekern, attorney general of Wisconsin who did the questioning, tried to make Mr. Dodge admit that the accounts were held because the company bought considerable merchandise from both Swift and Armour. Mr. Dodge made it clear however, that Wadhams lost the business of some firms with which they did reciprocal trading.

That ⅓-cent per gallon on all the gasoline business done by a well-organized firm was not an excessive loss to an Independent under the terms of the Q. D. A., was emphasized by J. M. Mc-

High Points in Q. D. A. Investigation

1. Oil men in Wisconsin think proposed General Order 25 of the state department of markets, frustrating Standard Oil Co.'s quantity discount agreements, will be issued.

2. General Order 25 deals with inter city business held by national marketing companies with big industrial concerns that have motor vehicles for which gasoline is bought in many cities. This inter city business means at least 3,000,000 gallons a year, in Wisconsin.

3. Independents testify the service station Q. D. A. contracts of big companies, take desirable gallonage from them. A few big Independents say the tank wagon Q. D. A. cause them to handle gasoline at a loss if they meet the Standard's scale of discounts.

4. Attorney General Ekern, mentioned as next Republican candidate for governor of Wisconsin, obviously tries to connect Q. D. A. with popular interest. He emphasizes testimony that it makes gasoline cost more to everybody, that its operation is discriminatory, monopolistic and illegal under market department rulings.

5. Standard Oil Co. attorneys, in cross examinations of witnesses, make many Independent oil men acknowledge there has long been a need of some recognized method of quantity discount in the gasoline business. Purchasing agents testify that they were almost always able to get lower prices than the public because of the volume of business they controlled.

Laughlin, Bartles-Maguire Oil Co., Milwaukee. He testified his company paid out $15,936.70 in rebates under Q. D. A. agreements after July 1, 1925, which amount represented slightly less than ½ cent per gallon on the total gasoline business done in that time.

Case May Broaden

Until the hearing in Milwaukee, the attack of the Wisconsin department of markets appeared to be only on the service station Q. D. A. In fact the proposed order 25, in its present form, does not contemplate a change in the Standard's way of doing business by tank wagon, especially where the contract calls for all dumps of gasoline to be made in the customer's tanks at one point, or even in one town. As expressed by Mr. Ekern, general order 25 is aimed at the inter-city business which the Standard has been able to get through big contracts affecting a large number of retail deliveries. The exact verbiage of the proposed order is as follows:

> In posting the conditions or circumstances for the charging of different prices of motor vehicle fuel, as provided by General Order No. 23, dated April 13, 1925, no such different prices at any place shall be conditioned in whole or in part upon sales or deliveries made at any other place. For the purpose of this order, "place" means a bulk station, filling station, or service station where motor vehicle fuel is delivered, or a point where delivery is made from a tank wagon.

It is entirely possible that the state's attack upon quantity price will not include action against the tank wagon Q. D. A. until the present program is carried out under the proposed General order 25, but that is altogether speculative. Testimony of the big Milwaukee Independents leaves an inference that business on the tank wagon Q. D. A. is done at a loss, at least as far as they are concerned.

Favorable to Q. D. A.

Mr. Ekern may be entertaining an idea that the Standard is willing to sacrifice its marketing profit to get volume, and enjoy the profits that volume brings to the refining department. Some of the questions he asked one witness in Milwaukee indicated such an idea. The witness was John F. Ford, Deep Rock Oil Co. of Wisconsin, subsidiary of the Shaffer Oil & Refining Co. His testimony seemed favorable to the Q. D. A.

Mr. Ford said the Standard's marketing plan had been met by his company, that it had effected an economy and had improved its gallonage. He was the only witness to relate such experience with Q. D. A. and Mr. Ekern immediately directed questions calculated to show a community of interest with the Standard Oil Co. Mr. Ford said his company had its own refinery.

K. H. Sus, manager of the central district for Sinclair Refining Co., said his experience was like that of smaller Independents, that the Q. D. A. had increased his company's solicitation expense, that it was not an economy, and that Sinclair woul dnot have gone into such a marketing plan had they not been forced into it to meet Standard's competition. In considering these opposite views it must be remembered that Deep Rock is one of the biggest distributors in Wisconsin and Sinclair is among the small ones, having begun business in the state about a year ago.

Inter City Gallonage

The first move by the department of markets was to keep the big companies from taking all the inter city business from the small companies. That is the business that General Order 25, when and if issued, will place again in reach of the Independents who want to bid for it.

There is no accurate datum on how much gasoline business actually is taken from small local concerns in Wisconsin by the service station Q. D. A. but the approximate inter city business of the Standard Oil Co. is known. The Standard arrives at its volume of inter city business about as follows:

Standard Oil Co.'s total gallonage in Wisconsin was 87,500,000 gallons in 1925. The company's total gallonage held on contract was 33,075,000 gallons, and its inter city business was 3.6 per cent of the total gallonage or roughly 3,150,000 gallons. This is about 1.25 per cent of the total 1925 Wisconsin business which was 250,000,000 gallons.

Three gallons out of 250 does not, at "first blush," seem to be a large portion of a business in a state, but the Independents in Wisconsin number about 300 and they have an aggregate annual turnover of 162,500,000 gallons. This is an average of about 542,000 gallons per year per Independent, so the Standard Oil Co.'s inter city contract business is equivalent to the total business of six average jobbers.

A Peculiar Statute

An experiment, like the one in progress here, probably could not be made anywhere except in Wisconsin. There is a law in this state called the "Department of Markets Law." It is wholly distinct from the state's anti-discrimination law which is very much like the anti-discrimination laws in other states. This department of markets law permits of quick action in branding as illegal anything generally looked upon as an unfair business practice. All the department of markets has to do is determine what the majority of men in any trade consider unfair; then they issue an order against such a practice and the order has the effect of a law with penalties attached for infractions.

The hearing showed the way the department works in determining the sentiment of the oil men in the state toward the Q. D. A. Edward Nordman, commissioner of markets and head of the department, presided over all the hearings but the first one held last Monday in Madison. He listened to everything Tuesday in Eau Claire, Wednesday in Appleton, and Thursday in Milwaukee. Questions were asked by Attorney General Ekern, aided only occasionally by his assistants.

In a personal way, Mr. Ekern can not be looked upon as a friend of the oil industry, or an enemy. He was one of those attorney generals that met in Minneapolis in 1923 and started all the political antagonism against the oil industry, but he was not cantankerous like some of them. He came home to Wisconsin after the meeting, conducted a quick investigation of the situation as it concerned his state and concluded that no good could be done by attacking the oil men; so Wisconsin escaped what South Dakota and Nebraska endured. In this investigation Mr. Ekern is carrying out the spirit of the department of markets law, and claims to be working in the interest of the consumer. It can not be overlooked, however, that his name is mentioned prominently as next Republican candidate for governor of Wisconsin.

Policy of the Department

The policy of the department of markets, in this investigation and in previous actions, has been determined largely by contact with the Independent jobbers of the state. Almost without exception the oil men testified in the recent hearings that General Order 23 of the department had been a benefit. (G. O. 23 is the order made last May 13 requiring all gasoline dealers to post on pumps and tank wagons the prices of all grades of gasoline to all classes of trade.)

The contact of the department of markets with the oil industry has been maintained largely by D. E. Montgomery, an employe. Almost every Independent oil man in the state has placed confidence in Mr. Montgomery and talked to him frankly.

Needed a Discount Plan

R. J. Fellingham, attorney for the Standard Oil Co. of Indiana, cross-examined every witness that Mr. Ekern questioned. His questioning was systematic, and the testimony of the purchasing agents added strength to the point which he evidently means to drive home to the court if his company sees fit to oppose the ruling, G. O. 25. In a vast number of cases he made the state's witness admit that there was a need of some standard method of giving discounts on quantity purchases. With few exceptions, they acknowledged that the best and biggest accounts, (the most desirable business) was enjoyed by some price-cutter who found that he could afford to give a discount to a big buyer, long before the Q. D. A. was ever put in effect.

Edgar Bogardus, assistant to the vice-president of Standard Oil Co. in charge of marketing, was questioned again at Milwaukee. This time he turned over to the department of markets, various contract blanks, private company figures, and lists of customers.

Ohio Jobbers Purge Souls of Petty Hatreds at Revival Meeting

By Roger B. Stafford
N. P. N. Staff Writer

COLUMBUS, O., Feb. 13

THE Ohio Petroleum Marketers' Association last evening concluded a two-day revival meeting in Columbus. Outward friendliness was displayed by warring neighbor jobbers after an emotional session yesterday morning and the association was put on a sounder basis both as to number of members and finances.

More than 260 men and women registered at this, the annual meeting and 14 equipment and oil companies occupied 15 exhibit spaces, the first display ever held by the Ohio association. Besides purging themselves of petty misunderstandings, following were the accomplishments at this gathering:

1. The membership roll was increased to close to 140 active and associate members.

2. The dues were increased from $25 a year to a minimum of $35 and a maximum of $200 a year, the amount being gauged by the number of bulk and service stations operated by each member.

Will Aid Refiners

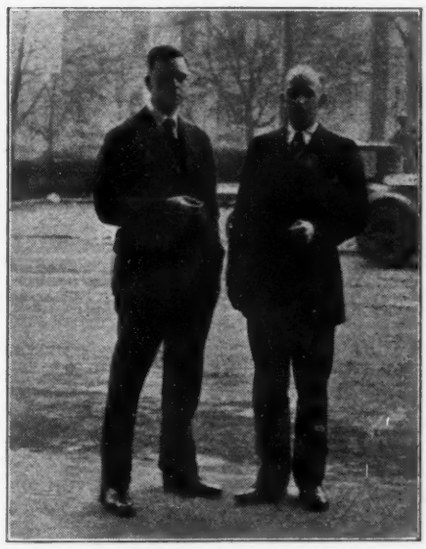
3. Determination to co-operate with the Mid-Continent Refiners' Freight Association to obtain lower freight rates into Ohio from Mid-Continent refining points.

4. Setting afoot a movement to combat any attempt to increase the tax on gasoline when the Ohio general assembly meets in 1927.

5. Elected the following officers:

William F. Burke, Cincinnati, Kentucky Independent Oil Co., president; J. L. Marsh, Youngstown, Vahey Oil Co., first vice-president; O. U. Latto, Uhrichsville, Latto Oil Co., second vice-president; R. R. Hart, Mount Vernon, Knox Oil Co., third vice-president; R. W. Palmer, Columbus, Accurate Measure Oil Co., secretary; C. A. Lucas, Toledo, Paragon Refining Co., treasurer, and D. E. Sullivan, Marion, Dependable Oil Co., sergeant-at-arms. Directors elected are: W. M. Thompson, Canton, Allegheny Oil Co.; John McMillan, Portsmouth, Portsmouth Oil Co.; J. W. Thompson, Coshocton, Thompson Gasoline Co., and S. E. McFarren, Akron, C. A. Pierce Oil Co. Wayne C. Hughes, Columbus, is field secretary.

The evangelistic session Friday morning grew out of price situations in Dayton and Washington C. H., and a questioning of the ideals and functions of the association and its officers. After a series of frank expressions of opinions the opposing factions clasped hands and apparently buried their hatchets. What good will come of this display of emotions can be ascertained only after months during which the contending forces will have been in their home towns striving for business. But the meeting afforded a good safety valve for pent emotions and every one present seemed better after the blow off.



C. A. Lucas, Paragon Refining Co., Toledo, and William F. Burke, Kentucky Independent Oil Co., Cincinnati, treasurer and president, respectively, of the Ohio Petroleum Marketers' Association.

Need of Confidence

Several speakers at the various sessions of the convention stressed the need of confidence in one another and that most of the market difficulties over the state were the result of lack of confidence in one's competitors. These speakers included Mr. Marsh who outlined the association's aims for 1926; James A. Gilmore, secretary-treasurer, Michigan Independent Oil Men's Association; E. E. Bessire, Lima, Radiant Oil Co.; C. A. Klunk, Marion, Dependable Oil Co., and L. B. Ratterman, Cincinnati, Hall-Ratterman Oil Co. Their analyses of causes of perturbed local tank wagon and service station markets were given in answer to a request of B. H. Ziehler, Dayton, Consumers Oil Co., for a statement of the association's ideals and the purpose of the field secretary and the board of directors.

Mr. Hughes said that he had traveled 35,000 miles over Ohio during the year, the first he had been field secretary. He had increased the number of members from 14 one year ago to 127 at the time of this meeting. This number was increased by the time of adjournment. Oil clubs were formed in Cleveland, Fremont, Marion, Uhrichsville and Columbus. An effort to form a club in Dayton had failed, he said. The association also had obtained lower fire insurance rates for its members; in some instances the saving amounted to 50 per cent of old rate rates. An audit of freight bills also had been provided for members. He was given a vote of thanks.

Will Publish Bulletin

Mr. Marsh announced the association planned to publish a monthly news bulletin to stimulate interest and confidence among the Independent oil and gasoline distributors. He said it was imperative to increase the association's revenue and recommended the following scale of dues which was adopted:

For one bulk and one service station, $35 a year; for the next five bulk or service stations $5 each per year, and for each additional bulk or service station $2 per year, with a maximum of $200. Mr. Marsh said that nearly all of the officers and directors would have to pay the maximum.

The freight rate situation was presented by both Mr. Marsh and B. F. Welty, who resigned as chairman of the association's special rate committee because he is out of the oil business. Mr. Welty, who is a lawyer and former congressman from the Lima district, was hopeful of relief for Ohio. He said that a jobber receiving a carload of gasoline from Group 3 daily for a year would have to pay approximately $16,000 a year more freight if his station were on the Ohio side of the Ohio-Indiana state line than if it were on the Indiana side. He recommended intervention in the Mid-Continent rate action.

The same group in the Ohio general assembly that put over the 2-cent gasoline tax a year ago will attempt to put over a 4 or 5-cent tax next year, it was said. Mr. Hughes asserted that the legal head of the Ohio tax commission had told him the oil men would have to pay because it was the easiest way to collect a tax.

C. C. Janes, Ohio State Automobile Association, said the state had let contracts for $35,000,000 worth of road work but had provided no funds for it after 1927. The Ohio assembly repealed a ½-mill road levy and the state automobile association would seek restoration of this, Mr. Janes said. That, he argued, would make unnecessary a further levy on gasoline. Under the Ohio constitution an excise tax cannot be used for construction work. Proceeds from the present gasoline tax are used for repairs and maintenance. Mr. Janes urged the oil men to start at once to combat the gasoline tax proponents who, in Ohio,

happen to be a bloc in the Republican party.

William J. Schafer, tax accountant in the gasoline division of the Ohio tax commission, answered questions concerning the administration of the gasoline tax in Ohio during the 10 months it has been in force. He admitted that the Ohio tax works to the disadvantage of Ohio refiners because the refiner had to pay the tax when selling to Ohio jobbers and no allowances were provided for losses due to leakage and evaporation. When jobbers buy from outside the state, the jobber pays the tax and pays on only the volume he resells, leakage and evaporation losses being deductable. However, if a jobber buys both inside and outside the state and sets up a loss claim, the commission did not investigate to find out whether it was the Ohio or foreign gasoline that was lost, unless the claim was unreasonable, Mr. Schafer added.

Mr. Schafer said brokers and jobbers may decide between them who shall pay the tax, although the Ohio law provides that the "dealer", the jobber in other words, must pay. Should there be an agreement that the broker should pay and the broker failed to pay the tax, the jobber would be liable to the state, Mr. Schafer warned.

An effort is being made by the commission and an oil company to have the attorney general test the levying of the tax on benzol Mr. Schafer said. The law mentions only petroleum products but all marketers of benzol blends but one are paying the tax. The one company is reporting to the tax commission the volume of benzol it sells but is refusing to pay the tax until the point is decided in court.

Jobbers reported their losses in gasoline averaged around 1½ per cent. R. C. Heil, Cleveland, Commercial Oil Co., said in cold weather he had a shrinkage of more than 4 per cent in his outdoor storage. The pendulum did not swing the other way in summer, he added, because increased evaporation losses prevented an average.

Discusses Gasoline Market

L. V. Nicholas stopped on his return to Chicago from the Federal Oil Conservation Board hearing at Washington. Basing a prediction on what he had heard from leaders in the oil industry, he said there would be no sharp upward turn in gasoline prices. He recommended that the Independent jobbers should stay in business rather than sell out to the large integrated companies or become parts of mergers. The smaller Independents were specialists in distribution and merchandising, he said, and this is an age of specialists.

He spoke of the advertising campaign of the Independent Oil Men of America and said many Independents were missing trade by failing to hook up with their fellow Independents in other localities through the exchange of I. O. M. A. coupons. Stereoptican slides of I. O. M. A. publicity were shown by Ray Shaw.

William N. Clark, Oil City, Pa., a salesman for the Quaker State Oil Refining Co., started the convention off with a peppy talk on salesmanship. There are six P's in salesmanship, he said: the Power to Persuade People to Purchase your Product at a Profit. There were four ways to get the profit, he asserted: 1. Belief in yourself; 2. Belief in the product you sell; 3. Belief in your company and its management, and 4. Power of speech.

Mr. Clark urged the jobbers to build clear and clean sales talks around their products. He recommended meetings of different classes of employes to get their ideas and to instill in them the company's ideals of service. Employes with imagination, with creative powers should be rewarded, he declared, and added that companies can shape their business lives by cultivating the imaginative powers of their employes.

Prof. J. A. Bownocker, state geologist and head of the department of geology, Ohio State University, gave an ABC talk on production and refining. Prof. Bownocker said he doubted that South American production would reach the proportions predicted for it and said that unless new fields with large wells were discovered, there would be a shortage of oil in the not distant future. However, he conditioned this prediction with admission of the fact that in the past the optimists had been nearer the truth than the pessimists. He discounted the value of shale oils with this question: "If you have to distill shale to get crude and then refine the crude, what would you men have to sell gasoline for?"

The Ohio jobbers were welcomed to Columbus by former United States District Judge J. E. Sater, president of the Chamber of Commerce who complimented them on being members of a courageous industry.

Registration fees included two luncheons and a dinner. At the first luncheon the Mono-Motor broadcasting duo of the Monarch Mfg. Co., Toledo, sang several groups of humorous songs. At the dinner entertainment was provided by singers and dancers as compliments of the Columbus Oil Club of which Frank C. Morrison, president of the Accurate Measure Oil Co., is head. The Columbus club also provided an orchestra for the dance which followed the dinner.

More than 50 women were registered and special entertainment was provided. An informal tea was given for them by Mrs. A. V. Donahey, wife of the Governor of Ohio, at the Governor's Mansion; they attended the dinner and dance, toured the city, attended a luncheon at the Country Club given by the Columbus Oil Club, and concluded the two-day program with a theatre party.

Coming Meetings

Illinois Petroleum Marketers Association, Bloomington, Ill., Feb. 24.

Western Petroleum Refiners Association, Texas Hotel, Fort Worth, Tex., March 2, 3, 4.

Petroleum Safety Council, Houston, Tex., latter part of March. Dates not set yet.

Wisconsin Independent Oil Jobbers Association, Hotel Pfister, Milwaukee, March 17.

National Petroleum Marketers Association, Congress Hotel, Chicago, April 6, 7, 8.

Petroleum Division, American Chemical Society, Tulsa, April 5, 6, 7, 8, 9.

Association of Natural Gasoline Manufacturers, Mayo Hotel, Tulsa, May 5, 6.

American Association of Petroleum Geologists, The Baker Hotel, Dallas, Tex., March 25, 26, 27.

Refiners Will Banquet As Usual At Fort Worth

TULSA, Feb. 15.—Traditions will not be shattered at the annual convention of the Western Petroleum Refiners Association to be held at Fort Worth on March 2, 3 and 4. It has been decided by the membership that the dangerous precedent of a convention without a banquet ought not to be established by the refiners' association.

Fort Worth had invited the refiners to attend a banquet during the course of their stay in that city. It was suggested that this might be substituted for the annual banquet and the question was submitted to a referendum vote. The vote was no.

Refiners will partake of one of the famous Fort Worth barbecues on the first night of the convention. The annual banquet with a full quota of after dinner speeches will be given at the Texas hotel on the second evening of the annual meeting.

St. Louis Petroleum Club Elects Officials

ST. LOUIS, Feb. 15.—At a recent meeting of the St. Louis Petroleum Club, Charles Ostoff, Jr., Liberty Bell Oil Co., was elected president; William Kleissly, of the J. D. Street Co., vice-president and R. F. Limberger of Blackmere Pump Co., secretary; A. H. Green of the Red Dragon Oil Co., treatsurer and H. Billings of the St. Louis Can Co. sergeant at arms. The following, in addition to the above named, were elected to the governors board:

Paul Brown, Independent Oil Co., R. J. Brown of the R. J. Brown Petroleum Co., A. C. Bauer of the A. C. Bauer Co., E. J. Keitel of the Columbia Oil Co., A. R. Chappell of the R. J. Brown Petroleum Co., and E. J. Adams of the George P. Jones Co. The annual inaugural banquet and dance was held Feb. 13.

Federal Oil Conservation Board Hearing

Discusses Opportunities for State Laws In Aid of Conservation

By A. L. Beaty
President, The Texas Co.

THE subject which I am to discuss does not include legislation by Congress, which is the only kind that could reach the Naval Reserves, the Indian Lands or the Public Domain of the United States. This preclusion of Congressional legislation is my only reason for not discussing it. The opportunity for such legislation is open and plain in relation to the lands just mentioned; it is free from constitutional questions which abound in almost every scheme of state legislation.

In state legislation one at first blush would expect to find ample scope. Nine-tenths of the country's petroleum production being drawn from privately owned or state lands, the same proportion would seem subject to state laws of conservation. In one sense this is true, while in another sense it is not true; it is true only to the extent that state conservation laws are permissible under the Federal constitution; for property rights flowing even from the state itself are protected by the Federal Constitution.

Large Question One of Policy

But what kind of conservation laws are we thinking of? Much depends on that. And there is more, much more, than power involved. The large question usually is one of policy. Should the states legislate the uses to which a particular product, owned as private property, shall or shall not be put? Assuming but by no means conceding that the state could enforce an enactment prohibiting the burning of residual oil under boilers, should the state undertake such a thing?

I submit that it is infinitely better to allow economic laws their play. It would be scarcely a step from a legislated use to a legislated price. On both points the unwritten but nevertheless inexorable law of economics affords a perfect remedy and leaves no debit balances for future adjustment; it cleans the slate as it goes. If fuel oil were withdrawn from the smokestack market it would be cracked into gasoline. Oversupply and resulting cheapness lead to waste, no less in gasoline consumption than in that of other products. One outstanding result would be the placement of a handicap upon railroads and industries now burning oil and building up motor bus lines and other unnecessary competition.

The natural trend is strong enough and should not be stimulated by legislation. Moreover, the new flow of fuel oil to the cracking still will start just as soon as crude production declines to the critical point. It will do so because of the price that will apply to gasoline; coal can be relied upon to stop the fuel oil price. Is it not illogical to inquire, therefore, What difference does it make whether the economic waste occurs in the fuel oil phase or the gasoline phase? Inevitably there will be this kind of waste whenever there is overproduction of the raw material, crude oil.

—Underwood & Underwood
Amos L. Beaty

Being assigned the topic as to what influence state laws might exert on oil conservation, A. L. Beaty, president of The Texas Co., presented much the same line of argument as Mr. Teagle in his paper. Mr. Beaty said economic law should be allowed full play, rather than arbitrary restrictive measures limiting uses of oils, saying that restricting use of fuel oil, for example, would work a hardship on present classes of consumers.

As to possibilities for state legislation having to do with the handling of crude oil, he said he believed the influence in the states would be towards producing oil cheaply for their people, rather than towards holding back production. He said he would be in favor of state laws allowing suspension of competitive drilling operations during periods of overproduction.

Coming now to the opportunities for state legislation having reference to conservation in the production and handling of crude oil I wish to observe that the legislatures of the oil producing states already have passed enactments touching many of the subjects that naturally come to mind. These enactments are somewhat varied and are far from uniform. Legislation in the different states on the same subject proclaims different rules. Subjects are covered in one state, while they are not touched in another. And, as would be expected, public sentiment back of the legislation varies still more.

It is not easy to obtain state legislation for the benefit of an industry, even when the reasons are perfectly plain. This is particularly true if the proposed act is in the least complicated. State legislators are often jealous of state sovereignty and independence. They are seldom willing to follow advice from industrial leaders, being almost invariably suspicious of such advice. They listen until they obtain a smattering of the subject and then feel prepared to make changes in bills submitted.

Bungling By Legislators

The result often is that a salutary measure, carefully worked out by experts, is changed until, when it goes to the governor for signature, it bears no resemblance to the original measure proposed. And again, it often happens that the suggestion of one measure brings about a discussion of the general subject and the introduction of numerous other measures growing out of that subject, so that the industry's last state is worse than the first.

Such things have caused industrial leaders to hesitate and have prevented them from taking the part which was theirs in the molding of legislation. It may be that in times past so-called industrial leaders have practiced deception, thus forfeiting their right to be followed. If it could be found that certain very plain remedies are needed for obvious and undisputed evils in our industry, on which after full discussion there should be no disagreement, and if the necessary enactments should be sponsored by this Board, it would

doubtless be easier to obtain their passage.

In the last analysis, state legislation must emanate from sentiment developed within the State. Until there is a developed and crystallized sentiment on a subject it is useless to talk about or hope for legislation. When the public feeling matures to the point where action is possible there is always danger of an extreme being reached. Year after year in state after state those who are conducting business on a nation-wide scale find it necessary to attend hearings and go into arguments and explanations on matters that are quite fundamental and well known to business men, but which must be taught to those who are not of that kind in order to prevent serious injury through foolish laws.

There is still another stumbling block. Not many of the States are interested as much in conservation of oil as they are in its development. States that produce none are anxious to become producers. States that produce little are anxious to produce more, and to them no argument in favor of conservation or holding back production would have a strong appeal.

I seriously doubt whether the great oil producing states of California, Oklahoma, and Texas, or any of them, would listen long to a plea that production should be held back for future generations. Rather they would prefer, if I am not mistaken, that the business go merrily on, with no restraints or limitations, since these would mean higher prices for products consumed in every-day life. This I think is true in all the States, and whether applied to the development of privately owned lands or State lands. The States, of course, where they hold lands or the minerals in ownership could withdraw them from exploitation. It is purely a matter of policy.

Without admitting pessimism in general, I must decline the role of enthusiast on the results that can be obtained from law-making though there are a few specific matters which I think may properly be mentioned in this discussion.

Waste in Excessive Drilling

Substantial waste occurs when oil pools are excessively drilled. I refer to cases where the surface has been divided into small plots, often town lots, with a variety of divergence of ownership. Wells are drilled on very small tracts of land, near their boundary lines, of course, and this in turn necessitates offset drilling by adjoining land owners to protect themselves against drainage, which applies to each successive ownership in turn throughout the area. Frequently ten or more wells are drilled within a space where good practice would warrant but one.

I have said that this is waste but have not said whether it is a waste of oil or a mere waste of money. There seems to be a difference of opinion among technologists as to whether the oil recovery is more or less than normal when the territory is thus abnormally drilled. Perhaps it may depend upon conditions in the particular pool. There can be no denial that such drilling results in very rapid development, meaning at times sudden large production, a flooding of the market, so that in addition to the drilling there are other losses.

From my standpoint it makes but little difference whether the waste is of oil or money. It is to be deplored. I realize that every competitive enterprise involves more or less economic waste, that this is to be expected and is unavoidable, and that the purposes of civilization have not wholly failed if people are given remunerative employment, even though they are engaged in work which is unessential to some extent. But that philosophy should not be carried too far. Millions of dollars could be saved by the adoption of proper practice in lieu of this irrational drilling.

The American Petroleum Institute is a constructive organization. Every member with a theory is given full opportunity to expound that theory and sustain it if he can. Three years ago some of us thought we had found a remedy for the drilling evil. We considered the draft of a model bill to be submitted to the legislatures of the oil producing States. It was studied by a committee of the Institute and a number of lawyers of recognized ability, and was redrafted until no further suggestion for its improvement was made.

As finally shaped and considered by the committee it conferred certain powers upon an established commission of the State, the Corporation Commission or such other commission or board as might be suitable. The bill itself defined prima facie a drilling site, fixed its size, but empowered the commission to change this by general orders applicable to specified pools or producing horizons and prohibited the drilling of wells within a stated distance of a boundary line or within a stated distance of another well, this to be applicable to each producing horizon separately.

Inasmuch as it was thought that such bare prohibition against the owner of a fractional drilling site might be unconstitutional because of depriving him of a right of use and enjoyment, it was provided that, in lieu of his right to drill, he could upon expert proof receive or recover drainage money if his land should be drained by others.

One Serious Objection

This proposed measure was given final study by the committee, with the result that in the end there was no support for it. It was felt that the owner of a fractional drilling site, without expending any money of his own or taking any risk, would be enabled to realize as much as if he had taken the risks, which would be unfair to the real operators, and that if this proved to be true portions of every oil pool would be cut into fractions solely for the purpose of obtaining this unfair advantage. These and other serious objections convinced the committee that no favorable recommendation should be made.

It might be possible to work out something feasible by reversing the idea and allowing the owner of a fractional site to drill upon it, but making him liable to those whose property should be unduly drained and perhaps requiring him before proceeding with work to file with the county clerk or some other proper authority a bond with approved security conditioned for the payment to other property owners of any net amounts to which they might become entitled by reason of his drilling upon the fractional site and thereby unduly draining their lands.

Of course, the entire matter of subdivision for drilling sites would have to be under official supervision, as is the rule in Texas now, and drainage

Change in Leasing Laws Would Handicap

PRESIDENT BEATY of the Texas Co. called the attention of the board at the morning session the 11th to the situation that would arise in the Rocky Mountain field were changes made in the leasing laws as applied to the public domain.

"In connection with Salt Creek and built up in connection with it there was one great company operating, and in recent years other companies have entered that field," said Mr. Beaty. "There might be a monopoly with no competition. That is not true at all now."

"The new enterprises that have been projected into that section, the Northwest, the refiners and marketing organizations, are built up on the leasing law, on the supplies of crude oil that can be developed under the leasing law. I know because of experience.

"A great deal of money is being expended in development down there. They are looking hither and thither for crude supplies, and the greater portion of that is under the leasing law, to support the new installations that have been put in that section by those who propose to compete with the company that was originally there.

"That section of the country cannot be supplied with crude or with the refined products from California. It can only be supplied at great expense from Group 3 of the Mid-Continent or some other section."

would be a subject of expert testimony. A well on a full drilling site would be available to take all the oil that could be taken through it, but a well on a fractional site would be considered as a means of taking too much, for which a remedy would be allowed.

To state in another way, property owners who could show that they had suffered drainage by reason of fractional-site drilling would be entitled to participate in the net production or net profits of the well. This would certainly discourage the bad practice, and it would have a strong tendency to bring about the voluntary consolidation of fractional sites. I hasten to say, however, that the present suggestion has not been submitted to the Institute and I would be unwilling to favor it until it had been submitted and had undergone the scrutiny of that organization.

Conservation in Storage

Occasionally in new pools, and especially where there is town-lot drilling accompanied by unit selling schemes, irresponsible operators bring in wells and permit them to flow into earthen reservoirs. All light oil, that which will flash below 175° F., should be placed in steel storage of approved type. Less volatil crude can be stored less expensively at times, but there should be strict rules for light oil. New wells of any kind should be allowed to clean themselves after being drilled into the pay, by flowing into temporary storage, if necessary, for not more than twelve hours.

Perhaps the waste in this connection is not sufficient to warrant the effort necessary to have the remedy adopted. I personally know of no serious case that has occurred since the light oil development at Smackover some three or four years ago. Responsible operators are careful. They conserve. Self-interest, if nothing else, would cause them to do so.

Legalize Suspended Operations

There is a State law which I would unqualifiedly advocate. It is an enactment which would make valid and enforceable agreements between operators to suspend their competitive drilling operations for given periods of time. It frequently happens that pools are extended and oil brought to the surface to be dumped upon the market when there is already a large surplus above ground. This occurs because each producer is unwilling for his neighbor to gain an advantage through aggressive development and drainage. Every well is offset as it is drilled.

Practically all of the States have strict statutes carrying severe penalties against agreements in restraint of trade, and some, if not all of them, may be broad enough to cover the kind of agreement that I have referred to, though it is reasonably certain, I think, that this was not actually contemplated when they were passed. It would be in keeping with the idea of conservation, in all of its sensible aspects, if the State legislatures would pass simple acts on this point. To protect the public, approval of such agreements by some commission or board should be required.

Has Stimulated Research

My feeling is that the work of this Board has greatly stimulated research. Already in one particular branch of the study strides have been made, and they are the result largely of the interest that was awakened by the questionnaires. What I have in mind is the increased recovery of oil from the sands and recovery from abandoned sands. A few, but not many, realize how much oil is left in the ground and abandoned apparently forever, under present and previous practice, until the President sounded the alarm and asked for conservation and this Board began its work.

I am very confident that, in the course of time, our present practice will appear worse than amateurish. The opportunities here are enormous in extent, the reward for success fabulous in amount, and we may expect invention on the same scale. Reflection upon this point, the possibilities of reaserch, must inevitably cause the item of legislation, State legislation, to become insignificant. And the same might be said of research in other directions, particularly in manufacture and in the higher and more economical use of products. Whatever the States may enact will be merely a few rules of the game—a few new rules, to find place with existing rules, written and unwritten. They will be in contrast with the game itself.

Fuel Oil Market is Economic Influence

By W. C. Teagle
President, Standard Oil Co., New Jersey

IN any discussion of conservation the public thinks in terms of government action, new laws, artificial restrictions or some form of controlled operation in the use of raw materials as the only measures for their preservation against the needs of the future. The average man fails to realize that true conservation of a raw material is its economical use.

Government action may bring about the economical use of a raw material, but generally conservation is more certain of attainment by science and economics. Science, through research, improves methods of production and manufacture. Economics, through price, creates the market. Price expands or contracts production and consumption and is generally the incentive to scientific research. Price is the controlling factor in conservation and, therefore, the influence of price is paramount in any consideration of the subject.

These general axioms are peculiarly applicable to petroleum and I hope to show that, in the evolution of the industry in the past few years, the influence of the price of fuel oil upon the production and consumption of petroleum has become a corrective force which will operate to attain the full measure of conservation which this distinguished board has under consideration.

That the fuel oil market which has been developed through cracking processes for turning fuel oil into gasoline is an economic influence towards conservation of our oil supplies that is already having its effect was brought out by W. C. Teagle, president of the Standard Oil Co. of New Jersey, in his address before the oil board. He said the price of fuel oil would become a corrective force which would bring about the full measure of conservation the board has under consideration.

That the price of fuel oil permits its consumption in substitution for coal has been the subject of comment and the suggestion has been made that this substitution be eliminated by some enactment or change in practice which will restrict the production of fuel oil. Such restrictions would unquestionably result in higher prices and would limit the use, but this condition, if due only to higher prices, would not of itself be a guarantee that the raw material—crude petroleum—was being economically used.

Two other factors must be considered: first, whether economical use of the raw material—crude oil—is not being attained under existing conditions, and, second, whether an attempt to change existing conditions by new laws and practices will not raise prices of gasoline and fuel oil unduly and thus make the cost to the consumer of the

limitations on use out of proportion to the advantage the public derives therefrom.

Three Inter-related Phases

Since its inception, the petroleum industry has passed through three closely inter-related phases, in the first two of which the value of a barrel of crude has been determined practically by the price that the public paid for a single product. In the early history crude derived its value from its kerosene content. With the exception of a comparatively small percentage of lubricating oil, other by-products were negligible factors in the computation of values. The price of kerosene governed the price of crude and the disposal of the by-product—fuel oil—was a much more important matter than the amount realized.

At the time when gas and electricity began to displace kerosene as an illuminant, the advent of the motor car inaugurated the second phase of the industry and kerosene lost its place to gasoline as the product determining the value of a barrel of crude. The price realized for the by-product—fuel oil—continued to be merely incidental. As the motor car came into more general use the increased demand for gasoline was met in large part by running additional quantities of crude, increasing to just that extent the surplus of the by-product—fuel oil—for which a market outlet had to be secured in substitution for coal.

Cracking Is Invented

The inventive energy of the industry, which has been continuously engaged on the problem of increasing the yield of the major product, was rewarded in 1912 by the commercial utilization of the cracking still which for the first time produced a major product from a source other than crude. This early invention and the various processes which came into existence during the next few years, while representing enormous strides in the science of refining, were limited to the cracking of distillates, leaving yet to be discovered the application of cracking to the fuel crudes and those of high sulphur content such as California, Mexican and Coastal crudes, the production of which in 1922 represented 45.82 per cent of the total supply.

The price differential between gasoline and the fuel oil value of these fuel and high sulphur crudes was the incentive for the further development of cracking processes which have been perfected within the past two or three years, and the industry is thus, for the first time, in a position to produce gasoline from them. Every grade of crude produced is now a potential source of gasoline.

Thus the third phase of the cycle of change has been reached.

What was formerly the by-product —fuel oil—can now be converted into gasoline. The effect of this is the same as though we had found a new raw material from which gasoline could be manufactured. Another source of supply has been created with a lower cost today for the raw material. In localities and under conditions where gasoline can be obtained from fuel oil at a cost lower than the natural gasoline in the crude, additional cracking facilities will be installed and there will be a reduction in the available quantity of fuel oil and an increase in the available quantity of gasoline.

—Underwood & Underwood
Walter C. Teagle

Fuel Oil Determines Value of Crude

This is a distinct and revolutionary change from the days of a spread of as much as 15 cents per gallon between tank car markets for gasoline and fuel oil. Gasoline produced from the initial distillation is, therefore, no longer the controlling factor in determining the value of a barrel of crude. The price of the by-product—fuel oil—has ceased to be incidental and has become a real factor in the determination of this value.

Although the discovery and development of the cracking principle has not only revolutionized the petroleum situation but has effected a conservation measure of incalculable value, it is doubtful if its significance is as yet fully grasped. Cracking has doubled our potential gasoline resources. Cracking has demonstrated that, with price incentive, further progress in the conversion of the less valuable products of petroleum into the more valuable is certain of accomplishment.

Price a Controlling Factor

Under these conditions it is reasonable to assume that, at such time in the future as the production of crude oil declines, or the consumption of finished products increases to the point of threatening a shortage, prices will advance and consumption will decrease, beginning with the use of oil for which a substitute is obtainable at a lower cost. This means, first, curtailment in the use of fuel oil for steam purposes. When the cost to the consumer of petroleum for steam purposes becomes higher than that of coal there will be a conversion from oil to coal, with a corresponding reduction in the consumption of fuel oil which so released will be available for conversion into products of higher value.

The fact that the petroleum industry has added so enormously to our national resources of the most valuable product of petroleum—gasoline—by the utilization of a by-product and thus attained a very large measure of conservation has evoked the natural query as to why this conservation should not be extended to the point at which the production of fuel oil should be so restricted as to eliminate its substitution for coal. Such a restriction would ignore the influence the price of fuel oil is exerting and will continue to exert upon the production of crude.

The Economic Tendency

Where gasoline can be produced from fuel oil by cracking, cheaper than gasoline produced from the initial distillation of crude, self-interest will prompt the industry to install cracking equipment rather than run additional quantities of crude. This has been the trend of the industry the past two years, a trend which will undoubtedly be more marked if, in the future, the existing differential between the price of fuel oil and crude be maintained or increased.

Refinery operations the past three years are illustrative of the economic tendency I have described. Gasoline was produced more cheaply from cracking than from the initial distillation of the crude. In this way, by utilizing only distillates 144,000,000 barrels of cracked gasoline were produced. To have produced this 144,000,000 barrels of cracked gasoline from the initial distillation of crude, on the basis of the average yield reported by the Bureau of Mines, would have necessitated running 585,000,000 barrels of crude. Thus the cracking process during the past three years actually conserved this 585,000,000 barrels of crude which is in excess of the total quantity of crude now in storage in the United States.

As the industry has now developed commercial processes to crack all grades of crude, the price incentive to extend cracking facilities and thus conserve crude is much greater today than when the industry was confined to the use of processes utilizing only distillates. Every barrel of crude is now a potential source of gasoline, but in most localities the fuel oil content is still the cheapest source.

Fuel oil today east of the Rockies is in direct competition with crude as a

source of supply for gasoline. Fuel oil has the advantage, owing to its lower cost, and as long as this price condition continues, increased quantities of gasoline will be made from fuel oil, reducing proportionately the demand for crude. The reduction in the demand for crude will be reflected in the enhancement of the value of the fuel oil content of the crude. By such enhancement the producer will be benefitted without creating the hardship for the consumer which would be involved in a sudden and drastic restriction of production.

Under conditions now existing the economic tendency will be to draw upon the whole barrel of crude—instead of a part of a barrel as formerly—for the essential uses, and the essential uses, for the first time in the history of the industry, will now determine both the volume of the production of crude that is necessary, as well as its price. The result of this orderly process will be a still further husbanding of the crude supply.

This is contrary to the theory that the only remedy for the competition of fuel oil with coal is through some form of more or less arbitrary restriction on the production of crude. Consideration of this theory necessitates a study of the uses in which fuel oil is consumed both in respect to conditions and localities.

Analysis of 1925 Market

Last year there was consumed in and exported from the United States approximately 400,000,000 barrels of fuel oil. Of this, it is estimated that 39 per cent was applied to uses where fuel oil has a value materially in excess of the price of coal, such as enriching coal gas, naval and military requirements, diesel motors, bunkers for passenger ships, and so on, so that this proportion of the total consumption does not come within the category of this discussion.

The remaining 61 per cent represented fuel oil which presumably came into competition with coal. The facts are, however, that only a part of it was in this class. The Pacific Coast, where coal is scarce and the price relatively high, where fuel oil has been the principal source of energy for more than a quarter of a century, and where any curtailment of the production and use of fuel oil would involve immediate commercial dislocation, if not disaster, consumed 21 per cent of the total. Fuel oil from Mexican and other imported crudes represented 15 per cent. It goes without saying that any limitations placed upon the use of imported crudes would simply divert them from the United States to foreign markets.

25% in Competition with Coal

So that, having accounted for 75 per cent of the total, it is found that, unless the economic situation on the Pacific Coast had been violently disturbed, and unless it were possible to regulate the imports of foreign crude, there only remained the crude equivalent of 100,000,000 barrels of fuel oil which could have been subjected to arbitrary restrictions in 1925. Therefore, any restrictions upon production, having for their purpose the prevention of the use of fuel oil in substitution for coal where the price of coal is the controlling factor, would have kept in the ground last year the crude equivalent of about 100,000,000 barrels of fuel oil, or 12 per cent of last year's crude supply.

The simultaneous development of a number of new fields, resulting in a sudden and very considerable increase in our crude production, would admittedly check this economic trend toward conservation and retard, for the time being, the further extension of cracking facilities. A flood of oil is always a possibility and in such a contingency it would seem to be in the public interest that cooperative effort by units of the industry to lessen so far as possible such over-production and prevent uneconomical use should be permitted. There are legal obstacles in the way of such action, but the possibility of over-production suggests that consideration of the removal of these obstacles might be within the province of the Conservation Board.

I believe the facts I have set forth show the industry is bringing about in an orderly and logical manner true conservation of our petroleum resources—a conservation which will give to the public the essential products at a reasonable cost, as opposed to a conservation brought about by restricted methods which would only result in increased prices without compensatory benefits to the consumer. The existence of the cracking processes and the relatively low price of fuel oil are, in my opinion, national safeguards against the uneconomical use of our crude resources. The inevitable conclusion would seem to be that the conservation of petroleum to meet the demands of the future depends upon price.

Small Volume of Fuel Oil for Cracking

WASHINGTON, Feb. 15

SECRETARY HOOVER, presiding at the session of the Federal Oil Conservation Board hearing the 11th, asked Mr. Teagle if he could say at what additional price of gasoline there would be induced an absorption of the major part of the present oil consumption as fuel.

"Suppose gasoline today is 20 cents a gallon. Would 30 cents induce the conversion of fuel oil into gasoline to the maximum cracking possibilities?" asked Secretary Hoover.

Mr. Teagle. "Well, I think the answer to that is that it all depends upon the price of crude and upon the amount of production of crude. Gasoline can be produced from Mid-Continent crude, say, and sold at a price today in the Mid-Continent field of about 11 cents a gallon in tank car lots. If fuel oil is selling for $1.25 or $1.26 a barrel, or 3 cents a gallon, then you will have a spread between the price of gasoline and fuel oil of 8 cents a gallon. Now if you can take that same fuel oil at a cost to you of 3 cents, and put it through cracking equipment and make gasoline at less than 11 cents, the advantage, of course, will be to make the gasoline from the fuel oil at the lower price.

"There will be left from the cracking operation a certain amount of fuel oil residue left which will have to go on the market. Last year, if the requirement of gasoline had been, say 70,000,000 barrels more than it was, if the price had been sufficiently high to justify the investment in additional cracking facilties, we could by the commercial yield that we were obtaining last year have supplied from the same quantity of crude the 70,000,000 barrels of additional gasoline.

Would Have Cut Surplus

"We would then have used up somewhere in the neighborhood of 100,000,000 barrels of fuel oil, so we would have had left instead of about 400,000,000 barrels of fuel oil, 300,000,000 barrels of fuel oil, and we would have taken the surplus of fuel oil out of competition with coal.

"There are certain uses, where the price of fuel oil is absolutely non-competitive with coal. A Diesel motor ship can afford to pay on today's basis of coal prices, 17 cents a gallon for fuel oil because it operates on an efficiency so much greater than the most up-to-date marine boiler plants.

"My theory of the thing is that it is progressive, that the price will regulate the question of how much oil should be produced, indirectly, of course, through the operation of supply and demand. If you go on replacing with products that are less valuable, for which they are substitutes, the price of crude will be based in the future on the value of the more essential products, instead of, as in the past, on the value of one product, having to throw away, from an economic standpoint at least, the less valuable product in the crude."

President of the institute Farish then took a hand in the discussion to point

out that the cost of conversion of fuel oil into gasoline generally taken by the industry is five cents a gallon and that cost of conversion would largely answer Secretary Hoover's question as to when the impetus to convert fuel oil into gasoline would be effective.

Mr. Teagle. "In California today, if I am right in my general information that the price of coal out there is such that oil would come to six cents a gallon, about $2.25 per barrel for oil before it would compete with coal, that six cents, with five to six cents for converting it, will give a basic price of somewhere around 12 cents.

"Today I suppose you can buy gasoline in California for probably 8½ to 9 cents. On that basis of 9 cents for the natural gasoline from the crude, there is no particular advantage just at the moment for the California refineries to put in cracking equipment to make gasoline out of fuel oil.

"It pays them better to take the natural gasoline out of the crude and sell their fuel oil as fuel oil in competition with coal. And the Pacific coast public is, of course, getting the benefit of the lower price of fuel. I do not think that, having in mind the general condition existing out in that section of the country, any one can contend that the use of oil there for the generation of power is an uneconomical use under the conditions now existing."

The Present Tendency

Mr. Davison, of the Gulf Refining Co. asked Mr. Teagle if the present economic tendency will not be to absorb the fuel oil regardless of the general level of gasoline prices, so long as fuel oil remained the cheapest source of gasoline.

Mr. Teagle. "Absolutely. You would not run on a higher priced crude if you could make the same product out of a cheaper crude."

Mr. Davison. "So that the question as to what the price of gasoline is at the present time is not, after all, the determining factor. The determining factor is, the cheapest source of gasoline supply, and therefore the economic tendency is to install cracking facilities and crack the fuel oil?"

Mr. Teagle. "That is the whole point that I tried to make in my paper yesterday."

Mr. Davison. "Is it a fact that little or no cracking is done in California, due to the oils there being more refractory than in the eastern country, where the five cent cost is available? If that is correct, then would that not mean an addition to the five cent cost in California?"

Difficulty in Cracking

Mr. Teagle. "We all know that in handling California crudes there has been some difficulty in cracking them with the original form of equipment. There is very little actual commercial cracking being done today on the Pacific Coast. That is for the reason that it is cheaper to make gasoline out of natural crude oil at the present price of crude than out of the cracked product.

"But there has been quite a large quantity of California crude cracked on the Atlantic coast because the cost of the crude brought around there and run through the most up-to-date method of cracking makes it possible to crack California crude commercially.

"Later on, if the condition of crude supply and prices in California change, there is no question but what California refiners will go ahead and install cracking equipment and crack California crude on the Pacific Coast. It has been done. I suppose one or two million barrels of California crude were cracked on the Pacific Coast last year and the yields from those cracking operations showed an increase from 15 to 18 per cent of the total content."

Owing to lack of space in this issue, the address before the oil board by Lester C. Uren, associate professor of petroleum engineering, University of California, on "Economic Losses in the Petroleum Producing Industry"; the paper prepared by Karl C. Schuyler, Denver, on shale oil possibilities as a substitute for well oil, and read at the oil board hearing; and the plan suggested by R. H. Smith, of the Oklahoma Oil Co., Philadelphia, for the government to register wildcat wells as a means of curbing production will be carried in the following issue of National Petroleum News.

Spark on Definition of Waste

MR. MARLAND took the floor in the open forum at the close of the morning session of the oil board the 11th to make the point that the oil industry and the oil press and newspapers have been talking about waste, when they really meant wasting an opportunity to make a profit. "We have not really meant we were wasting oil," Mr. Marland said.

Mr. Doherty: "Mr. Chairman, when I say we are wasting oil, I mean we are wasting oil. I do not mean we are wasting an opportunity to make a profit. The waste in the petroleum business is shocking. Also, Mr. Chairman, Mr. Marland said at a meeting less than two years ago that to his thinking, the waste was criminal."

Mr. Marland: "Mr. Secretary, I was then suffering cruelly and stood in need of a profit."

Mr. Marland. "Mr. Teagle, is it your opinion that if we have for a short space of time a relatively higher price for gasoline, that that will result in very largely inceasing cracking facilities in this country and bring about a stability of crude price never before known?"

Mr. Teagle. "I do not think there is any question about it."

Mr. Marland. "And the bringing about of that stability?"

Secretary Welch of the Institute. "I would like to ask a question, Mr. Teagle. If you were to exclude California oil—you pointed out that there is a special situation there—and if you were to exclude imported Mexican oils and other imported oils, do you believe the total quantity of fuel oil east of the Rocky Mountains, if subjected at any reasonable price to cracking, exceeds 100,000,000 barrels on the basis of last year's total?"

Mr. Teagle. " I do not think so. I have no way of showing what the actual figures are."

Analyzing Yields

Mr. Welch. "I would like to suggest that there is a rough way to get at it by analyzing the yields of the refineries. If you start with the Atlantic Coast refineries and go clear through to the Rocky Mountains, it will be found from analysis there is practically no fuel oil derived from the Mid-Continent field or from the eastern crudes which are being made in any quantity.

"For example, on the Atlantic Coast most of the fuel oil produced from the refineries comes from imported crudes. Practically all of it is cracked and a very small proportion of fuel oil produced. When you pass over to the Pennsylvania region the amount of fuel oil produced by the Pennsylvania refineries is negligible. When you get into Ohio the amount of fuel oil produced there amounts to practically nothing.

"When you pass on to Illinois and Indiana, the vast refineries in that territory, taking, for example, the plants of the Standard Oil Company of Indiana, produce practically no fuel oil. When you pass on to Wyoming and to the Mid-West plant out there, the crude oil on the whole is being converted into these more valuable products.

"So when you go on down to the Mid-Continent fields, even in the case of the Kansas and Oklahoma refineries, your cracking facilities have not been fully developed as yet. The yield of gasoline in Kansas and Oklahoma, is already 50 per cent; so that really there is concentrated down in the Mid-Continent fields and in Texas a comparatively small amount of fuel oil which can be subject to cracking."

Federal Oil Conservation Board Hearing

Legislate Unit Pool Development

By H. L. Doherty
Henry L. Doherty & Co., New York

Arguing from the standpoint of the need for conservation of oil resources as the nation's most important munition of war, H. L. Doherty, head of the Henry L. Doherty oil and gas and public utility interests, said the government had all necessary authority under the Constitution to legislate providing for the unit operation of oil pools. He stated that, by such unit operation, we can recover at least double as much oil as we get under our present system and it is highly probable that 85 to 90 per cent of all the oil pool contains can be recovered. As in the past Mr. Doherty's remarks on this subject drew considerable comment on both sides from the house.

PETROLEUM is a wasting asset. Every barrel we produce or waste, reduces our national stocks to that extent. The mere fact that we have produced huge quantities of petroleum and have never had a serious shortage is no evidence that we can always produce all the petroleum that we need, but is evidence only of how much we have already used or wasted. Ever since the advent of the industry, somebody has always been predicting an early shortage, but it has never come true.

This, however, is not proof that it cannot come true and yet the failure of these predictions of shortage has caused thousands of men in the petroleum business to believe that all predictions of a shortage will prove untrue; and the failure of these predictions has convinced them that, therefore, we must have an adequate supply no matter what our future demand may prove to be.

There is no evidence that anybody can offer that we have an adequate supply; and if you will put the acid test on the reasons given to support the theory of an ample supply, you will find nothing worthy of serious consideration other than the argument that all previous predictions of a shortage have been proven to be untrue. On the other hand, you will find an abundance of evidence to indicate an early shortage of petroleum.

Evidence of Future Shortage

All our most probable territory has been explored and much of it perhaps almost completely explored, and it has either been abandoned or exhausted, or is in the process of exhaustion. Our consumption has grown so enormously that all of the petroleum ever produced in some of the older producing states would be an unimportant contribution to what we now need. For example, petroleum was first discovered in New York in 1864 and yet all of the petroleum produced in this state up to the present time would only last, at our present rate of consumption, less than a single month. The following table is interesting and I think should be a warning to everybody of the rapidity with which we are consuming our petroleum deposits. The first column gives production to date, the second, the exhaustion of this entire production at our present rate of consumption.

—Underwood & Underwood
Henry L. Doherty

	Barrels	Months
Pennsylvania	780,318,000	13
Ohio	506,529,000	9
Illinois	357,157,000	6
West Virginia	338,179,000	6
Indiana	112,246,000	2
New York	59,808,000	1
	2,154,237,000	35

I am not predicting a shortage of petroleum at any certain date, but am predicting the possibility that it may occur at any time, and predicting with great positiveness, a serious and an embarrassing shortage before provision has been made to meet this shortage unless something is done by this board.

The production and consumption of petroleum is not controlled by or in conformity with out market needs. We find the petroleum as fast as we can and produce it as fast as we find it, and consume it as rapidly as we produce it.

The science of finding petroleum has only really come into existence in a comparatively few years, and no branch of science has probably been developed much more rapidly. Many research laboratories have been at work in recent years on new methods and new instruments, and no one can foretell what the next few years or even the next few weeks will bring forth to make the discovery of petroleum more easy and more accurate.

Development of Science

What has been said about the development of the science of finding petroleum is but a small part of its effect. Perhaps no other science has had such a widespread application in the same length of time. A few years ago the science of locating petroleum without drilling for it was crude compared to the present, and known only to a few men. Today it is well-known and widely practised by thousands of men. A few years ago practically every wildcat well was a wildcat well by virtue of being located without scientific guidance. Today there are practically no wildcat wells, for few wells are located except on scientific guidance.

The enormous increase in our American production of petroleum in the past few years has been no accident, but has been due to the development of this science and its widespread application. The development of this science and its widespread application threatens to locate all our petroleum quickly and when located it must be produced and when produced it must be consumed. In a single twelve months period we increased our daily rate of production by more than 50%. The petroleum industry is not only a highly unstabilized industry, but it unstabilizes other industries—and especially the coal industry.

Important Munition of War

Petroleum is our most important munition of war. If war should come again in 36 months, there is no certainty that we would have an adequate supply. Other mineral resources have vast bodies located and blocked out which could be quickly drawn upon if an emergency required it. As for petroleum, we have no ground reserves and are dependent entirely on new discoveries even to maintain the existing rate of production. To attempt to develop our shale and coal resources for oil after we got into war, would simply reduce our war efficiency.

A long war could come and go before our coal or shale would be able to make a substantial contribution to our

needs. An abundance of available petroleum would greatly deter other nations from making war on us, and a shortage of petroleum would invite such a war. The development of aircraft and the further development of the submarine, and the self-propelled submarine torpedo, makes it doubtful that foreign petroleum, subject to the risk of ocean transportation, would be of any assistance to us.

The wastes in the petroleum industry are of shocking magnitude. It is admitted even by those who disagree with me most radically that, by ordinary methods of flowing and pumping, we leave in the ground in some pools more than ten barrels of petroleum for every barrel we recover. These same people must admit there is a flagrant waste of gas in nearly every petroleum field, and in some instances more gas is wasted, when measured by the fuel energy of each, than the entire amount of petroleum that is recovered.

If we continue our present policies, we will become a pauper nation so far as petroleum is concerned before the petroleum resources of many other countries have been seriously drawn upon. The United States has largely supplied the whole world with petroleum. If we have a shortage of petroleum, we will pay dearly for what we must buy from foreign countries.

Now this may look to you like a very serious situation—and it is, but we still have it within our power to immensely better our situation and, if we still have the ability to provide even a reasonable portion of our needs for petroleum, we can at least postpone all of these evils and for many years yet to come.

Present Laws to Blame

The petroleum business has many evils, more than any other business I am familiar with, but I know of no evil about which the industry, the public or the Federal and State Government have a right to complain that does not spring from the bad practises that are forced upon us by irrational laws that are different from other property laws and in violent conflict with natural economic and physical laws.

All of these evils can be corrected if we will make our laws in conformity with the facts. A petroleum pool is by nature incapable of being divided up and operated according to the surface divisions that have been arbitrarily created. It must be devoleped as a unit to prevent both the waste of petroleum and gas and economic waste as well. Our present laws not only produce a shocking waste, but they violate the principles of our form of government. If 100 people own property on an oil structure and 99 wanted to defer the time when the oil should be produced, a single owner can either rob them of their oil or force them to drill at his will and can carry out his operations in a manner that will sacrifice the greatest part of the value of the deposit.

In my opinion we leave more than four barrels of oil in the ground for every barrel we now recover by flowing and pumping. All the oil that has ever been recovered except by flowing and pumping is so little as to be no factor whatever in our petroleum needs. There is no certainty of recovering a substantial amount of oil from our abandoned fields or of recovering it except at very slow rate of production.

By the unit operation of pools, we can recover at least double as much oil as we get under our present system, and it is highly probable that we can recover 85 to 90% of all the oil the pool contains.

Avoid Waste of Gas

We now waste enormous quantities of natural gas, which can be conserved if we operate our pools as units.

This is the only country in the world that is known to have helium gas in commercial quantities. We are burning or wasting every day natural gas containing hundreds of thousands of cubic feet of helium gas. If we should find a remarkably rich deposit in association with an oil deposit, it would be impossible to conserve it under our present system. No machinery could be put in motion in time to save it. Under the unit operation of pools, it would all be conserved and each oil and gas pool, when emptied of its original content, would make a tight reservoir for either natural gas from other pools or a place to store gases highly concentrated in hellum.

If we were working under the unit operation of pools, we would have large ground reserves of petroleum located and blocked out and all our war needs could be quickly met.

If no other benefits would be realized from the unit development of pools other than to create ground reserves that could be drawn upon in case of war, this alone would be an enormous contribution to the welfare of the nation.

The predictions made by many that science will find substitutes for petroleum, not now forseen, are mere drafts upon the imagination of the authors of these statements. They have no basis for such statements. Petroleum is not a mere material, but a highly concentrated form of energy. A gallon of petroleum has an energy value in excess of 75 pounds of TNT. The law of the conservation of energy is as inflexible as the law of gravity. These statements are in effect the prediction that we will be able to amplify energy or create energy out of nothing.

It is desirable for many reasons that the laws necessary for the production of petroleum should be passed by the federal government. We now have a hodge-podge of laws made by the courts and passed by the states which are not uniform, and in some instances prevent efficient operation. For instance, water can be used advantageously in some pools and yet the use of water in some states is forbidden. For many years water was used surreptitiously in the Bradford field of Pennsylvania, and yet it required several years to change the laws so water could be used. Few of the states have proper bureaus or staffs of experienced men to guide their legislative policies on oil production.

At present we need only to rescind all present laws and pass one law providing the unit operation of pools. If we were allowed to develop our pools as units there would be no necessity for any government regulation or supervision. If the federal government has the power to legislate how oil shall be produced and asserts its right to so legislate, I assume this would suspend the state laws. Prompt and effective action is needed and it can only be secured, in my judgment, by Federal legislation.

I hold that the federal government has ample power to legislate under the power given to it in the constitution to provide for the common defense. It not only has the power, but has assumed obligations to the states that make it the duty of the federal government to conserve the most important munition of war which is now being unnecessarily wasted. I know many eminent lawyers disagree with me, but I think their disagreement is due to a misconception of the evidence which alone clothes the federal government with the power to act and the obligation to act.

Power Under Constitution

The power to conduct war was vested exclusively by the constitution with the federal government and was surrendered by and forbidden to the states, and the federal government assumed the obligation to protect the states. It seems to me the non-producing and non-offending states have a perfect right to insist that the federal government take whatever steps are necessary to prevent the unnecessary waste of the nation's most important munition of war, and the federal government can do nothing less than comply if it is going to carry out the obligation to these states which it has assumed.

I can see nothing that is either surprising or unreasonable in holding that the federal government has ample power to do whatever is necessary to prevent waste and conserve the most important munition of war. Nor can I see how the federal government can do less and still fulfill its obligations to the states. Nor do I think that time should be wasted in "passing the buck" between federal government and the oil producing states. It must be remembered that a change of laws would have the effect of creating more property and would not be either a taking of property nor a harmful or improper restriction in the use of property.

Federal Oil Conservation Board Hearing

Anti-Knock Fuel Not Widespread Enough To Justify High Compression

By C. F. Kettering
General Manager, Research Division, General Motors Corporation

AS AN introductory remark to this paper, I will say that all of the statements made here are based upon presupposing that the performance of the motor-vehicle is as we have it today.

In order to give a clear picture of the things that have been done toward working out the relationships between fuels and motors, I believe that a brief resume of the history of the work done by the writer and his associates would be of some value.

In 1910-11, the writer introduced on automobiles a new type of ignition system, which involved the substitution of a storage battery and an electric generator for the magneto used universally at that time. This change was followed in 1911 by the further adoption of the electric self-starter, of which the battery ignition system became a part.

At that time there was much prejudice against this new type of ignition and in favor of the magneto. It was but a natural result that almost everything that happened to the motor car was laid at the door of our organization, as being directly or indirectly caused by the changed ignition.

Starts Knock Investigation

When, in 1913, the Cadillac Motor Car Co. had more or less trouble in the field with what they called "spark knock," it became the writer's duty to try to find out what the cause of this was, and to apply a remedy. An indicator of European make was used to investigate the problem, with the result that some of the factors involved in the knock, later known as detonation, were found, but only in a very general way.

Later, while we were working on the development of the farm lighting plant known as Delco-Light, the underwriters expressed a desire that we run these motors on kerosene, if possible, instead of on gasoline, because of the then existing code relative to the amount of gasoline permissible in a private house.

In connection with these tests, we found out two things which directly contradicted what we had regarded as fundamentals up to that time. We had always thought, first, that a lot of heat was required when using a low-grade fuel; and we had thought, second, that the knocking characteristics of fuel were a function of volatility.

That is to say, it was our idea that a high boiling fuel knocked badly and a low boiling fuel not at all. But we found, to our surprise, that, inasmuch as the engine upon which we were working was a single cylinder one, into which the question of distribution did not enter, that it was not necessary to apply any additional heat even when running on kerosene.

In fact, it was desirable to keep the heat down, for without it the engine ran much freer from knock.

We found, too, that sulphuric ether, which is the material used in medicine for anaesthesia and which is a very easily vaporized liquid, knocked even worse than the poorly volatile kerosene. Another compound, called butyl alcohol, which is identical with sulphuric ether in molecular size and in ultimate composition, but which is the more difficult of the two to vaporize, apparently had no tendency to knock at all.

From this analysis we came to the conclusion that some of the prevalent ideas relative to compression and motor economies were perhaps not correct.

—Underwood & Underwood
C. F. Kettering

An increase in the efficiency of the automobile of from 20 to 40 per cent is possible when conditions make it practical for the automobile designers to raise the compression ratio of their engines to 6 or 6½ to 1.

Designers in the past year or two have slightly increased the compression ratios of their engines to take advantage of the slight improvement from an anti-knock standpoint of the gasoline generally marketed over the country.

This improvement in the anti-knock quality of fuel in general is not sufficient, however, to justify any further increase in compression ratio at present.

When the oil companies have made generally available fuel suitable for high compression engines it will take about seven seasons to bring about the replacement of all the automobiles now in service with high compression cars.

With high compression engines established, and with further knowledge that will result from continued study of the problem, it is possible that an increase of 50 per cent in gasoline mileage will be ultimately achieved.

Midgley Gets Busy

Later on, we turned the knock problem over to Thomas Midgley, Jr., together with the indicator and such other apparatus as we had accumulated. He began an intensive investigation of it, and studied, also, the factors involved in the control of efficiency in an internal combustion engine.

The indicator was first redesigned so as to make it possible to secure diagrams showing just what the variations in pressure are under normal combustion, and under knocking combustion. This new instrument showed us in a graphic manner that when the thing we call knock occurs there is a violent disturbance that comes shortly after ignition—and not before it, as people had previously supposed.

This disturbance manifested itself as an apparent and very rapid rise in pressure, which came on more in the form of a sharp blow than as a smoothly accelerated increase in pressure. Further study showed us that this knock was first of all a function of the fuel, and that it was, second, a function of the compression of the engine. An increase in compression aggravated the knock in proportion to the magnitude of it. If the engine compression was made high enough, the knock became not only unbearable, but also power consuming as well.

Compression Controlling Factor

Now, it had previously been determined by the ordinary course of experimentation that one of the most important factors controlling the economy of an engine was that of compression. And here we had found that engine compression in turn was limited absolutely by the knocking characteristics of the fuel used in it.

So these early indicator diagrams which we secured gave us a correct and very use-

ful picture of the whole problem, as well as of just what happened in the engine.

With the knowledge gained in this study, and bearing in mind always that to get better economy the compression of engines must be raised, we started out to find what might be done to prevent this abnormal rise in pressure, which up to that time had been called spark knock. A great many things were tried.

Various theories were evolved, only to be disproved. At last, as the result of all this preliminary work, we found that the simple introduction of a small amount of iodine into the fuel changed its combustion characteristics to an amazing degree.

Iodine Impractical

We realized, of course, that as a practical solution of the problem the use of such a substance was utterly out of the question. But the discovery of this remarkable knock-suppressing property of the material did give us a base line from which we could work. Many months of experimental effort followed. The result was that other materials, like aniline and xylidine among strictly organic substances, and some compounds of selenium, tellurium and lead were found to have a similar effect upon the characteristics of combustion, some of them much greater in magnitude than iodine, our first discovery.

Results Published in 1922

Giving the principal results of this investigation, Thomas Midgley, Jr., and T. A. Boyd presented a paper before the American Chemical Society in 1922 entitled "The Chemical Control of Gaseous Detonation With Particular Reference to the Internal-Combustion Engine." The many practical presentations that have been made of the matter since have made the development a very familiar one to the oil industry at large, with the result that the general distribution of a fuel which does not knock has become one of its earnest objectives.

Our interest at that time, as members of the automotive industry, was to analyze out of all this what part of these factors belong to the fuel, and what was the thing that the fuel industry might probably best do in their line.

Very early in our research, we established contact with some of the important members of the oil industry, and we have been working in closest co-operation with them for the last six or seven years as individual companies, and later through the American Petroleum Institute, despite any statement which may be made to the contrary.

Work Summarized In Equation

As a sort of summation of all this work from a popular standpoint, the following equation may be presented:

$$\text{KNOCK} = (P^x \times T^y)\ K + E$$

This simply says that for any permissible knock there is a balance between P, the compression pressure of the engine, and T, the temperature of the charge at the time of ignition. K is a constant for the fuel used, E is a characteristic of the engine, which, in the last analysis, may also be resolved back into factors of pressure and temperature.

A strict mathematical interpretation of this would demand that P, which in the equation stands for pressure, should be D for density. But, for a popular interpretation, it is better understood in a qualitative way by calling it compression.

It is quite desirable to raise this pressure or compression to a certain degree in order to increase economy. There is attached hereto a curve which shows the increase in thermal efficiency, or fuel economy, with increasing compression ratios, compressions being total cylinder volume, divided by the clearance volume. This curve is set out as representing full load conditions.

Gain Greater Than Shown

The gain in efficiency resulting from increased compression becomes even greater than this chart shows when the part load is taken into consideration, and the automobile runs most of the time at very light loads.

The conclusion of the United States Bureau of Standards is that by raising the compression pressure of automobile to a ratio of six and a half to one, and making those changes in the car which this would make possible, would give an increase in part throttle mileage up to 27 per cent, the normal or present ratio being considered as four and one-half to one. Actual test shows that an increase of one-half this amount gives 20 to 30 per cent.

A reduction of the temperature, Factor T, can be secured by lower water jacket temperatures, and by lower temperature of the mixture, both of these resulting in reducing the mixture temperature at the time of ignition.

Effects of Carbon

The accumulation of carbon in engine cylinders has a two-fold effect; first, decreasing the clearance volume, and second, inhibiting the transfer of heat from the compressed gas to the cooling system.

K is the fuel characteristic. So far as the layman is concerned, it is made up of two factors: volatility and chemical composition. A paraffin fuel of high volatility knocks less than a paraffin fuel of low volatility.

Thus, gasoline from Pennsylvania crude oil knocks much worse than gasoline from another source. This is due to the fact that some of our oils have a number of constituents, known as cyclic compounds, which do not have anything like the tendency to detonate or knock as the so-called chain compounds.

The laws governing these have been pretty well worked out, and for any known fuel, an analysis of its chemical makeup gives a pretty good indication of how it will perform in a motor.

It therefore follows that there is a very wide variation in the knocking tendency of fuels found throughout the country. This may be due, as mentioned above, to the nature of the crude from which they are refined, or it may be due also to the process of refining.

In order to make a step which is really worth while in increasing the economies of internal combustion engines, we have set it down, more or less arbitrarily, after a long series of tests, that a certain type of straight run Pennsylvania gasoline, plus 40 per cent of benzol, would represent a base line for this new type of motor fuel.

This standard was selected because of the fact that in almost any condition under which it was operated, it was an anti-knock fuel. It was also of such a nature that with slight revisions in the motor compression and in the rear axle ratio, an increase of from 25 to 35 per cent could be obtained from the vehicle in question.

Great Variety on Market

There is now being sold on the market a large variety of motor fuels, which on the basis of tendency to knock, may be determined as varying from the equivalent of this set standard on down to not better than the straight run gasoline.

But the motor industry has felt that it was not feasible for them to make any radical changes in motor design, unless they were assured of universal distribution of fuel of the type mentioned above, from which the gain to the public would far out-weigh the cost to them.

The refining industry, through new or modified processes, use of benzol etc., can at present supply about 10 per cent of our last year's requirements of anti-knock gasoline. By a combination of these methods, it is possible to produce from one-fourth to one-half of our supply of such a grade as to permit of a change of engines, which would mean an increase of efficiency of 20 to 40 per cent.

Along with this standardization of fuel from the standpoint of detonation characteristics is the other and very important one of the ability of a fuel to start readily, and there are also wide variations in this factor. So far as the motor engineer is concerned, he would be very much happier if the country either zoned out as to average temperature throughout the year, or if all the fuel were mixed together and served in a common pot, so that fuel volatility would be a uniform thing.

This would allow him to design carburetor systems to meet this condition exactly.

Volatility Related to Economy

Volatility has a direct bearing upon economy in the method which must be used in distributing, the low volatility requiring more heat for proper distribution. By way of explanation it might be mentioned that the carburetor is purely a metering device and after the air and fuel are properly proportioned, the question of distribution comes in; and in a manifold feeding four or more cylinders, a proper metering of the whole charge does not insure each cylinder getting its proper amounts of fuel and air.

Heat and various mechanical devices have been used to assist in even distri-

(Continued on page 48K)

Federal Oil Conservation Board Hearing

The Constitution Gets Into the Debate

MR. MARLAND took issue with certain of Mr. Doherty's statements as the afternoon session of the 10th came to a close.

Mr. Marland. "Gentlemen, I am so used to having Mr. Doherty make fun of us oil men that I am not quite sure whether he was not doing it this morning in some of the things he said. I can hardly think he was quite serious in some of his suggestions.

"He seemed to me to suggest then, and does now, that 99 men in 100 men pools should have the right to compel one man to refrain from producing his oil, even though he might want to produce it, and might have to produce it to get the money to live on, because the price was not high enough to satisfy the other 99.

Looked Up Constitution

"He suggested to us that he found something in the Constitution of the United States that would permit the Federal Government to enact laws to control the situation. I think that he was making fun of us on one occasion when he told us where he found any such provision in the Constitution.

"At a meeting of the Directors of the American Petroleum Institute, and I think it was in a meeting of the full Board, he told us that he had instructed his lawyers to see if they could not find in the Constitution some provision that would permit the Federal Government to enforce this slow drilling plan and increase prices.

"He said his lawyers had reported back to him they find no such provision in the Constitution, but that he was not satisfied with that opinion, and he then got a copy of the Constitution and read it himself; that he sent out for a copy of the World Almanac, and found a copy of the Constitution in that World Almanac, and devoted an hour or two to its study. Then he found therein these things that his eminent lawyers could not find for him.

"I think he was making fun of us when he said that. And I am just wondering whether he was not making fun of us here this morning in some of the scientific theories he was propounding and whether he did not get that also out of the World Almanac."

Mr. Doherty (Interposing). "Mr. Chairman, I think Mr. Marland is dealing in a little sarcasm, but I would say that I was making a serious suggestion here."

Mr. Marland. "I am sure of this, that I have never seen anything of the kind in any of the scientific practices I have ever known. And I am quite sure that my experience, and my scientific reading do not permit me to think that you can get more oil from a pool by drilling one well and then another at some later period, and distance apart.

Intensive Drilling

"All of the pools I have ever been in, and all of the scientific study I have ever made, teach me that you can get more oil from any pool by drilling a greater number of wells at the same time. You might not make so much money, but that is the industry's trouble, that is not conservation.

"I wish to say that I do not subscribe to Mr. Doherty's theory that you should drill but one well in ten acres if you want to do the best by the public and conserve oil. I really believe you can do better by drilling ten wells in one acre and running all of them at the same time. It might cost the industry more but you will conserve oil."

Mr. Doherty. "I am not seeking to make fun of the petroleum industry and never have. I am trying to explain a lot of things that the public cannot understand. We have got lots of critics of the petroleum industry, and there are among them critics we need to fear, because they believe our business is either grossly mismanaged or manipulated. They see oil go from $3.50 per barrel to $1.50 per barrel, or vice versa, and they can think of it only as manipulation.

"What I am trying to do is to make the public understand, to make everybody understand that our troubles spring from the laws under which we operate. I think that is a very important thing to do.

"Mr. Marland makes fun of my study of the Constitution. Do not forget that if an amendment came up tomorrow we would have to vote on it, and if we have not intelligence enough, if we had knowledge enough to frame a Constitution we certainly have intelligence enough to interpret it.

"I still believe, and gave the reasons in my paper, why the Federal Government has the power to enact laws to control this matter—because the several states under their laws make it possible to waste oil, and the Federal Government cannot carry out its pledge to the other states except by conserving oil."

(Continued from page 48-J)

bution. As shown before, increasing the temperature of the mixture increases detonation and lowers efficiency.

Refiners are now turning out fuels which in some instances are better, from a knocking standpoint, than those produced in the past. But still only a very small percentage of these fuels can meet the desirable knock rating specification mentioned above.

Must Standardize Quality

In most cases the improvement is too small to permit the use of the fuel in engines of the desired compression ratios. Before the American public can have more efficient cars, it is necessary for the oil industry to standardize and to get a national distribution of fuels which are of high knock rating, so that manufacturers can build cars of the higher efficiency.

It is safe to say that when this is done, the American public can expect the 20 to 40 per cent increase in efficency in their vehicles as a first step, and probably greater increases as the usages gives us experience whereby we can make still further steps.

During 1925, over nine billion gallons of gasoline were consumed in American cars. This is equivalent to a 10-thousand gallon tank car full every 35 seconds, or nearly two car loads every minute.

The petroleum industry has increased the amount of gasoline produced from a barrel of oil from four gallons, or 10 per cent, in 1905, to 14 gallons, or 33 per cent, in 1925. Thus, the oil industry can give startling figures covering the service which they have given and the advances they have made.

But in this connection it is important to note how the degree of gasoline volatility has decreased on the average from 1915 to 1925. As we have stated before, the tendency of a fuel to knock increases in general as its volatility decreases. This means that in accordance with the data in the chart, the knock rating of our fuel to-day is not nearly so good as it was 10 years ago, for the effect of the higher distillation range is more than enough to off-set every gain that has been made by refining methods.

Conditions now are such that, in general, new cars have to be run on the same fuel as old ones. But those changes which will raise the efficiency of the motor car will have to come first of all as a distinct step in fuel characteristics:

First, there must be a wide distribution of a suitable non-knocking fuel, so that new motor vehicles can be produced on the higher efficiency order, and—

Second, ordinary fuels must be produced in gradually decreasing quantities to supply the existing automobiles over the next few years, in order that the utility value that is existent in the present car may be kept available to its user.

Federal Oil Conservation Board Hearing

Trend is Towards Refining Products Of Highest Utilization Value

By George S. Davison
President, Gulf Refining Co., Pittsburgh

A very interesting analysis showing the possible scope of refinery yield to give maximum outputs of the various principal refined products, was presented by George S. Davison, president of the Gulf Refining Co., Pittsburgh, in his paper read at the oil board hearing on "Possible Changes in Refinery and Marketing Practices." He showed that, while the refiner has considerable leeway in adjusting his refinery practices to provide the greatest outturn of products in greatest demand, he has customers for other products which must also be taken care of; and that, without restrictions of any kind, refiners would work up their crude into products which would bring the highest net return, which by implication, serve the markets oil can best supply and not products of another nature.

THE history of petroleum refining is well known, and the past can be dismissed with but brief reference; it is the future which concerns us.

The first problem of the early refiner was to get from his crude oil, say, 50 per cent of carbon oil or kerosene, and the second, to make away with the remaining parts of the crude oil not needed for fuel under the stills and boilers. The latter was a difficult problem for the refiner where no drainage was available, as could be seen by the oil-soaked ground for large areas around interior refineries, whereas those situated at tide water or on the bank of a river had an easier way of getting rid of the products not needed, although such conveniences did not altogether prevent the oil saturation of the immediate landscape.

More Crude Utilized

The views of the refiner have materially changed since that day. Now there is not the smallest fraction of the crude oil, whether solid, liquid, or gaseous, which cannot be made to serve a useful purpose, and for the most part is so utilized. As an indication of the change, not only from my boyhood days but during the last 20 years, one of our experts at Port Arthur ascribes the recent return of the mosquito plague there to the fact that oil seepages and overflows from the refineries have been kept off the surface of the bayous. This improvement is due in part to the striving for economy by the refinery people, but in part to the vigorous campaign of the Departments of War and Interior to stop the pollution of navigable waters.

Limited to Percentage Yield

There is a limit to what the refiner can do in the way of increasing the percentage yield from his crude oil. Inasmuch as petroleum is not readily oxidizable, he can not add oxygen from the air to his output as a lead refiner can, nor from its inmiscibility can he add water to it as the lime slaker can do to his product, and the ultimate limit of his yield is 100 per cent by weight, which perhaps it is unnecessary to say, can never be obtained. Even 100 per cent by volume is impossible under any ordinary conditions.

The more petroleum is broken up into its ultimate products—lubricating oils, cracked gasolines, and highly purified products of any kind—the greater the discrepancy between 100 per cent and the percentage output. It is impossible even to pump petroleum from one tank to another without incurring some loss, and the only way of getting 100 per cent by volume even in the simplest kind of refining is, as has been the case in some instances, when by trade custom the gallonage of the product is based on an arbitrary weight per gallon favorable to the refiner.

Disregarding the wastes of former years, statistics show that for the year 1925 fully 98 per cent of the crude oil was transformed in the refineries into salable products, though a part of this was as a matter of economy used in the refineries as fuel in place of coal.

—Underwood & Underwood
Geo. S. Davison

At many points it is more economical for the refiner to use his own oil than to bring coal into his refinery. In some cases, regardless of the comparative costs of coal and oil, the refiner's stills and boilers have been built for the use of liquid or gaseous fuel and do not permit the use of coal; and there are certain semi-liquid products made in refining processes which, while suitable for fuel on the spot, are not suitable for shipment and sale.

I give here a tabulation showing in column (1) an estimated refinery yield based on statistics of the consumption of various petroleum products in the

Manufactured Petroleum Products

Grade	Bbls. 42 gal. (1)	% of Crude Run (2)	1925 Maximum Possible % of Crude (3)	Possible Combinations % of Crude (4)	Possible Combinations % of Crude (5)
Motor Fuel	236,244,000	28.7	60.0	40.0	50.0
Kerosene	62,023,000	7.5	25.0	9.0	9.0
Gas Oils	32,500,000	3.9	50.0	3.0	2.0
Diesel Engine Oil	14,000,000	1.7	70.0	5.0	10.0
Lubricating Oil	30,632,000	3.7	20.0	5.0	10.0
Wax	2,114,000	0.2	0.5	0.3	0.5
Asphalt and Road Oils	22,401,000	2.7	15.0	2.5	1.0
Coke	4,365,000	0.5	....	0.7	1.0
Marine Fuel	110,000,000	13.4	80.0	11.0	3.0
Land Fuel	284,272,000	34.5	80.0	16.7	4.5
Miscellaneous and Loss	5,000,000	0.6	....	0.8	1.0
	803,551,000	97.4		94.0	92.0
Refinery Loss		2.6		6.0	8.0
		100.0		100.0	100.0

year 1925; in column (2) the percentage each group is of the estimated crude run; in column (3) the ultimate percentage that could be made individually from crude of each group, with no provision for the manufacture of any of the other groups; in columns (4) and (5) two yield statements showing how crude might be subdivided if the necessities required. Of course such possible yield schedules might be made up without limit as to number.

There are limitations to the shifts in a manufacturing yield schedule. Supposing it should become possible to make each one of the maximum outputs given in column (3), 100 per cent, it would not be possible to take advantage of such possibility, because the otherwise unfulfilled demands for other products would prevent making the maximum production of any one product.

While under conditions of urgent demand and satisfactory price it might be possible to turn 60 per cent of non-refractory crudes into motor fuel, there are other demands which would prevent this.

The needs for machinery lubricants will increase over the 4 per cent of the 1925 statistics instead of decreasing, and at the present time there is no known substitute for petroleum lubricants satisfactory in quality and sufficient in quantity. Thirty years ago it was said that besides its ostensible uses, paraffine wax was used as a substitute for, and an adulterant of, almost everything which cost more than it did. I do not imagine that the variety of demands have decreased any in the intervening time, and it is hardly likely that satisfactory substitutes in any large amount could be found.

May Eliminate Kerosene

In time in this country the use of kerosene for lighting could probably be almost entirely substituted by electric lighting, so that this particular part of the petroleum yield could be turned to other uses.

Then there is the household use for heating of oils which might otherwise be largely turned into motor fuel. With prices of the latter high enough the domestic use of these light oils would undoubtedly be replaced by that of coal, or coal gas economically made and distributed.

Of course when people install Diesel engines they burn their bridges behind them as far as the use of coal is concerned, and this demand for Diesel oil must be met, unless Diesel engines are discarded.

Unless restricted by law, the refiner is likely to work up his crude petroleum into products which will bring him the largest net return, with the exception that it is generally found necessary to supply customers with some products at a loss in order to maintain their patronage for other products in which there is a profit.

Although I have mentioned the possibility of legal prescription as to the products to be made and not to be made from crude oil, you doubtless appreciate the danger of attempting to change by fiat the natural course of economic development, and the automatic adjustment to each other of supply and demand.

There have been many changes in marketing practices. These have been brought about by the severe competition among the factors in the industry. This same cause will doubtless lead to further changes in such practices in the future. Just as those changes which have been made have had the effect to better the service and lessen the price to the consumer, it is fair to assume that the future changes will also accomplish this same purpose, but I cannot see that these changes in marketing practices will tend to accomplish the result of conservation of petroleum which the commission is now considering.

Methods of Recovering More Oil

By James O. Lewis
Petroleum Engineer, Tulsa

Mr. Lewis, who is a member of the firm of Smith, Dunn & Lewis, pioneers in the use of air and gas in driving out oil from the sands after the natural gas pressure is spent, told the board that in his opinion the recovery of oil from the sand by the ordinary methods does not on the average exceed 10 to 20 per cent of the oil contained in the sand.

He described in detail the three main methods so far tried for increasing this recovery, air or gas under pressue, flooding and mining. He said that it appears to him that the first method to be used is the air method and that the results and conditions of the future should determine what steps should be taken next.

In this address Mr. Lewis pointed out that such operations must be carried out on a large scale and stated that it is necessary, where leases are comparatively small, that they be merged or pooled under one ownership or one management in order to get results.

In part 2 of this paper, to be published in a succeeding issue of this paper, Mr. Lewis relates the methods used by his company in pooling properties in Oklahoma and cutting the air pressure process to work on them.

As a result of progress made in the technology of oil recovery, the industry has come to believe that but one-third of the oil in the same is being recovered. For myself, I have long held that the average recovery was between 10 and 20 per cent, and I have seen no reason to change this view. But the amount of oil being left underground cannot be precisely guaged at this time, and the fact of first importance is that three commercially used processes have extracted from 100 to 300 per cent more oil from old fields that were thought to have been exhausted. Furthermore, it is known now that none of the three methods so far applied have extracted all the oil from the rocks.

I do not think I exaggerate when I claim that the extracting of more oil from the oil sands is today the major problem facing the industry. Here is a vast reserve of oil already defined, and awaiting but the ingenuity of man to make it available. From the porous rocks in which it is held like water in a sponge, the natural force has been depleted, and the remaining oil lies dormant in the rock for want of an expelling agent.

Only Gas Pressure Spent

In the past, the oil man has tacitly assumed that the declining yield of his wells meant the exhaustion of the oil itself, whereas we know that it is not the oil that is exhausted, but only the natural gas which was the principal agent for forcing the oil out of the sand and into the well. Between the wells, some four to nine times as much oil remains as has been pumped to the surface.

Nature provided only enough gas to expel a minor part of the oil and artificial forces must now be applied to extract the remainder. Until recently, our attitude was comparable to one who purchased an automobile with a tank full of gasoline, and then abandoned it as useless when this original supply of fuel was used up.

Before considering the evidence supporting the statements as to the amount of oil that has been left underground, I wish to review briefly the conditions

under which oil is commonly found. With minor exceptions, the oil is found in the almost microscopic pores of sands and sandstone, which occur in layers interbedded with shales and other impervious rocks.

How Gas Expels Oil

In these porous layers of rock the oil is accumulated in pools which usually occupy upfolds in the rocks and which are usually surrounded by water saturated rock at lower levels. Dissolved in the oil, gas is found under high pressure, and when a well is drilled into the sand, this gas expands and forces the oil into the well, just as seltzer water is forced out of the bottle by the expansion of carbonic acid gas dissolved under pressure in the water.

At times there is a surplus of gas which separates from the oil and accumulates in the higher parts of the rock. This undissolved gas is known as free gas.

Much force is required to expel the oil from the fine pores of the rock. Under average conditions, the gas issuing with the oil represents an expenditure of energy equal to 10 horse power hours for each barrel of oil brought to the surface.

This means that the work required to expel the oil from the sand is equal to the work performed by a horse in a 10-hour day. So tightly held is the oil in the sand that it takes all of the energy stored in several barrels of oil to recover one barrel of oil and to recover the remaining barrels of oil that have been robbed of gas, outside force must be applied.

Percentage Recovered Varies

Conditions vary so widely in the oil fields that the percentage of natural recovery can be expected to vary widely also. Occasionally individual properties in a pool, and rarely whole pools, may show a comparatively high recovery. This is particularly true with regard to oil found in porous limestones that is flushed out with water as in Mexico or at Elbing, Kansas, but we are here dealing with the average conditions and not with exceptions.

The difficulties of accurately estimating from surface evidences the original quantity of oil in the sands are well known to every one familiar with oil field conditions.

But though one source of evidence may be questioned as being unsatisfactory, the cumulative effect of many different sources of evidence all converging to the same conclusion is entitled to much weight.

Outlines Conclusions

I think it is desirable to outline briefly the nature of the proof and to show that these conclusions are well founded. Not all of this evidence has heretofore been published. You will note that where one line of evidence may be open to attack, the gap is closed by another line of evidence, and the whole presents a strong front.

I take them up sector by sector.

1. Estimates based on the area, thickness and porosity of the sand bodies most commonly show from 5 to 20 times as much capacity to hold oil as the oil recovered. Such estimates have been questioned because of likely errors in the porosity and thickness of sand and because they assume that the oil originally occupied the entire capacity of the sand body.

1500 Feet of Gas to Barrel

2. On the average, about 1500 cubic feet of gas is produced with each barrel of oil, and this gas has an average pressure of about 750 pounds and solubility of about 40 per cent at the underground temperature. The barrel of oil produced could contain only 120 cubic feet of the gas produced so that the remaining 1380 cubic feet came from the sand where it was either held in solution in 11½ other barrels of unrecovered oil, or else occurred partly as gas.

If the former, the average recovery would be less than 8 per cent.

This evidence checks the estimates of capacity in sector one, for even if all of the gas produced had been free gas, it would occupy five times as much space underground as the barrel of oil produced. If all the gas was in solution, it would indicate 12½ times as much capacity.

This evidence reduces the question to what part of the space might have been occupied by free gas. Fields which are known to have a body of free gas above the oil are excluded from this estimate. It is possible that a little free gas may be entrapped in the irregularities of the sand body, but it does not appear physically possible to have partial saturation to an appreciable extent under common oil field conditions.

3. Laboratory experiments conducted under conditions far more favorable for high recoveries than in the oil fields, indicate that only low recoveries can be expected from the expansion of the charge of gas that can be absorbed in the oil. The same experiments also show that a smaller percentage of the contained oil is expelled from a partially saturated sand than from a fully saturated sand, though the volume of gas is much greater. The efficiency of expulsion becomes less and less as the oil is depleted from the sand.

Close Spacing More Oil

4. Field experience data, as well as theory, demonstrates that closer pacing of wells greatly increases the recovery of oil at a rate approximately inversely proportionate to the distance between wells. Thus with wells 660 feet apart (10 acres to each well), showing a 10 per cent recovery, the recovery would be 20 per cent if the wells were spaced 330 feet apart, and 40 per cent if the wells were 165 feet apart and so on.

The underlying law is more involved than the approximate rule given, which holds reasonably true only between ordinary variations in spacing and which is reduced to absurdity if followed without modification to the ultimate limits. But the evidence shows beyond any reasonable doubt that but a small part of the recoverable oil is being obtained by prevailing well spacing.

5. At Pechelbronn, France, 15 miles of galleries have been driven through the oil sands, and it has been ascertained from large scale operators that only 14.3 per cent of the oil had been recovered by the wells, that an additional 43 per cent is being recovered under commercial conditions by drainage into the galleries, leaving another 43 per cent in the rock. Near Hanover, Germany, under conditions paralleling those of the salt domes of the Gulf Coast, the recoveries from wells was but 13.7 per cent.

Two Cases Not Typical

These two instances can hardly be taken as representing average conditions, but at least they are indicative of what may be expected elsewhere. The system of drainage galleries used is a special application of the law of well spacing, and vindicates the deductions made from it by increasing recovery from 14.3 to 57.3 per cent at Pechelbronn.

6. Cores taken through supposedly

Debates Views on Recovery From Old Fields

THE paper presented by J. O. Lewis on rejuvenation of old oil fields brought forth considerable questioning from the floor as to points brought out in his paper. Mr. Doherty said he could not share Mr. Lewis' figures and views on the recovery of oil from these old pools.

"My contention is that the only way in which you can control your edge water and your rise in your structure is by maintenance of your gas pressure. And this thing of letting a field become flooded with water, or something of that sort—you never can go back and recover as much as by simply maintaining your pressure and holding your oil in the original way.

"I still contend that the way to operate a pool—I guess he and I agree on that, but he says he does not think it could be done legally—is to operate it as a unit, and I maintain that the operation of a pool as a unit would only be in conformity with the other laws that govern us everywhere else.

"As it now stands, if you have got 100 surface owners of pools, any one man on that pool, under our present laws, can either drill and rob his neighbor of oil or he can force the other 99 to drill against their will, and he can also dissipate gas pressure and make it impossible to recover the maximum amount of oil, and waste the gas besides."

exhausted oil sands at Bradford and elsewhere in the United States for the most part confirm the above evidence. At Bradford the natural recovery indicated by the few cores taken has not been 10 per cent, although the sand is shown by the cores to be saturated from top to bottom.

The shoe string sands of Kansas are special conditions, and could be shown to be such by the other tests here given.

7. Laboratory experiments indicate that from 15 to over 50 per cent of the oil under the common range of conditions would not drain out or flush out with water and cannot be blown out with either air or gas. This represents the oil that will require special treatment either with heat or with some agent that will loosen its adhesion to the sand grains.

Laboratory Experience

Under laboratory conditions, air or gas will recover the most oil, drainage next, and water will recover the least. The remaining portion of the oil adheres so closely to the sand grains that it is irrecoverable by present commercial practices. It will require special treatment by heat, chemicals or other agents which will loosen its hold in the sand. Until such agent capable of commercial application has been discovered, I estimate the irreducible minimum that must be left in the sands as from 25 to 75 per cent, according to local conditions.

At first thought, it would seem absurd that 80 per cent to 90 per cent of the oil was being left underground, and the industry has justifiably demanded ample proof of such claim. When I made my first estimates for the Bureau of Mines in 1916, I had more reasons to support the conclusions of myself and others as to this low recovery than I then published, for I thought it wise to be conservative on so radical a proposition.

Evidence Is Confirmatory

The evidence since has been confirmatory, especially that from France and Germany of 14 per cent recovery, which closely coincides with my estimate of 10 to 20 per cent, but exact estimates are still impossible. However, the evidence is, I think, sufficient for present purposes.

I do not think this oil left underground can fairly be considered a waste for it is still recoverable and its value as a reserve for future needs is greater than would have been its value if it had been possible to throw it on the market during these past years of over supply.

Broadly speaking, I estimate that one-seventh of the oil has been recovered by old processes, another seventh seems possible by present commercial practices for rejuvenating depleted oil fields, another two-sevenths seems possible by improvements in present rejuvenating processes and three-sevenths can be recovered only by radical improvements over methods now in use.

To recover the oil left underground, it is first necessary to loosen the hold of the oil to the fine pores in the sand and then to force the loosened oil into the well or gallery from which it can be brought to the surface. Air, gas, water, and the pull of gravity all act both as loosening agents and carrying agents, but by itself none of them will completely remove the oil even under the most favorable conditions.

To gain very high recoveries it will be necessary to supplement these carrying agents with some additional agent that will reduce the tendency for the oil to adhere to the sand grains.

Under forseeable economic conditions, such agent must be applied to the rock while in place, for there seems to be no reasonable hope of being able profitably to mine the sand and bring it to the surface to treat it there. Heat is one agent that can be used to reduce the adhesion of the oil to the sand, but I believe this will be of limited commercial application because so much of the heat will be wasted in heating up the rock itself and the same heat could be better used turned into mechanical energy.

Soda Ash Effective

Dr. Nutting of the Geological Survey, has discovered that soda ash dissolved in water is an effective agent, and this is being tried in the Bradford field. It is yet too early to say whether this will be effective under commercial conditions.

The discovery of a successful commercial usable agent for loosening the oil from the sand would at least double the recoverable reserves.

The three successful processes that have been used on extensive commercial scales are, first, forcing the air or gas under pressure through the sands; second, forcing water through the sands; third, digging galleries through the sands into which the oil drains.

Various combinations or modifications of these methods have been proposed, but none has yet been used on such a scale as to give experience data of dependable value. It may be expected that each process will be modified and improved, that each may be used in combination with one of the others and that supplementary processes will be used in conjunction with each of them. At the present, the field of increasing recovery is but little explored and during the ensuing years the various processes suggested will be tried out until the more suitable ones are determined for the various conditions which must be met.

Price of Oil Factor

As one of the most important conditions is the price of oil, it may be expected that the processes to be used will change as prices are stimulated or depressed by market demands.

The use of air or gas most closely resembles the usual conditions of natural production, the depleted natural gas being replaced by air or gas compressed by machinery.

The air or gas is forced into certain wells on the property from whence it makes its way through the oil sand into nearby producing wells. The only special equipment required is the compression plant and this becomes a combination pressure and gasoline extraction plant, as the air or gas picks up gasoline vapors in its passage through the rock.

If a gasoline compression plant is already on the property, it can often be used in whole or in part with a consequent reduction in installation cost. Ordinarily few or no new wells need be drilled.

This process has been in successful commercial use for 14 years, first in the eastern fields and more recently in the western fields where many plants are now being installed. Figures are not available as to the number of wells to which it is being applied, but I estimate them as not less than 20,000, most of them being in Ohio, West Virginia and Pennsylvania. From the few cases where records of past production have been obtainable, the increased recoveries will average 100 per cent. That is, if a property has produced 100,000 barrels under natural pressures, an additional 100,000 barrels is recoverable under air.

However, these properties are hardly representative of average conditions and there are many reasons for believing greater recoveries will be obtained elsewhere with more recent knowledge of recovery methods. It is of interest that water flooding following up the use of air in three cases failed to extract more oil from the sand.

At the present time the chief objection advanced against the pressure process is the need of isolation or unit operation for most effective use, but decided progress is being made in effecting consolidations of properties. The principal difficulty to overcome in operation is the tendency for the pressure to follow the less productive parts of the sand, but marked progress has been made in overcoming this trouble.

Low Installation Costs

The process is particularly attractive because of its low installation and development costs, which together are often as low as $50 an acre as against several thousand dollars for each of the other processes. For deeper and thicker sands, the cost may be much greater, but even then, it will be but a fraction of the costs for the other two processes, particularly as the cost will be reduced where gasoline plants can be used for pressure purposes.

Because of the length of Mr. Lewis' paper, the remainder will be carried in the following issue of National Petroleum News.

Federal Oil Conservation Board Hearing

Future Oil Supply More Certain Than That Of Staple Food Crops

By E. W. Marland
Marland Oil Co., Ponca City, Okla.

There is a ten years' supply of oil in the tanks and in proven leases of the oil industry, E. W. Marland told the conservation board. He states that the future supply of oil sufficient to meet the country's needs is more certain than the future supply of cotton or corn or wheat..

One of he greatest necessities of the American people, he declared, is cheap gasoline which they now enjoy because of overproduction of oil. He stated that any measure that might be taken that would tend to increase the cost of gasoline to the people would be of serious effect on curtailing their opportunities to travel, become acquainted with their country and make friends with the people in distant states, whereby the whole population is drawn closer together.

Mr. Marland stated that if ever a shortage of oil did appear, that condition would immediately bring an increase in price and the increased exploration and drilling that would follow such an increase in price would again bring in new fields and cause overproduction of oil with consequent receding of prices.

THE question of the adequacy of our supply of oil to meet future demand and of the necessity for conservation, is not a new one. It has been with us from the infancy of the industry and will probably be with us 100 years from now, if science, before that time, has not harnessed some natural energy for the use of man and made the internal combustion engine obsolete.

Having been in the oil business for 30 years, I could not help but be interested in, and take part in, the discussion of this subject.

I am not one of those who believe that there is any necessity for conservation, because I believe that there is a sufficient supply of oil to meet the demand for internal combustion fuel and lubrication for centuries to come, probably as long as our civilazation and its necessities for petroleum shall exist.

Having heard so much talk of conservation, naturally, I have considered how conservation might be effected, if, and when, necessary, and I could not avoid the conclusion that conservation must take the form of restricted production and restricted consumption.

Monopolistic Control

To me, such restriction seems possible only through either government ownership or monopolistic control. The first, of course, only possible after the taking over of our oil properties by the government by due process of law. The second course only possible after the repeal of all of our anti-trust laws.

From the public's point of view it would seem to me that either of these courses would be highly undesirable, and, since the object sought by those who seem to think conservation necessary appears to be that of restricting consumption to essential uses, it is my belief that it might be less objectionable to the public to legislate directly against consumption for non-essential uses, rather than to limit consumption by restricting production.

—Underwood & Underwood
E. W. Marland

Overproduction has always caused oil to be cheap and is responsible for the cheapness of gasoline and lubricatiing oils.

Restricting production would mean the end of cheap oil and cheap gasoline.

Overproduction is the only protection the public has against higher prices.

Essential users must not think that they can cheapen prices by limiting the use of gasoline or oil to essential purposes. Prohibiting consumption of that part of a barrel of crude oil which now sells in competition with coal would necessitate its storage by the industry and would add to the cost of the lighter fractions in consequence.

An abundance of gasoline at low prices is one of the greatest necessities of American life, and if it is borne in mind what cheap gasoline has done for the American people, it will cause your board to consider seriously the advisibility of recommending any change in our present methods of business which might cause an increase in price.

It is in my mind that cheap gasoline is one of the greatest, if not the greatest, educational influence in American life today.

Cheap gasoline has made it possible for every American man, woman and child to know their country, to know its resources and know its beauties.

No other nationals in the world know their country as our American people know ours—thanks to the cheap flivver and the still cheaper gasoline.

Last week, while I was driving through the oil fields of California, I saw hundreds of cars, mostly from our northern states, containing whole families who had fled from the northern snows and who were gaining health in the sunshine of that climate.

Last summer there were literally thousands of cars driven by their owners, accompanied by their families, from the Atlantic Ocean to the Pacific and back, and almost as many thousands were driven from the Pacific Ocean to the Atlantic and back.

Possibly these people visited friends. Certainly they made friends on the other coast.

They Learn to Know Country

They got to know their countrymen and their problems,—agricultural and commercial. They exchanged views with one another,—upon all manner of subjects, religion, politics, business and the relationship of one to the other.

Who can say that this joy-riding is a non-essential use of gasoline? It has made our America the most comfortable and pleasant place of all the world for man to live in.

America has been called the great melting pot of humanity. Cheap gasoline is keeping that pot boiling.

Restricted production of petroleum in the interest of conservation, means the end of cheap gasoline.

After spending my whole life in the oil business and having given it most

thoughtful consideration from every practical and scientific angle, it is my belief that there is no reason to talk of restricting production.

It is my firm conviction that the public of the United States has less reason to fear a shortage of petroleum for its essential uses than the petroleum industry has reason to fear, that, because of inventions, discoveries and changing conditions, there will be left on its hands an enormous supply of oil for which there will be little demand.

There is as much reason to fear a shortage of the food supply of the United States, or of the cotton supply for future generations as there is to fear a shortage of necessary oil.

The supply of oil this year, or next year, or for the next 10 years is more certain, than is the supply of cotton, unless we find some way to destroy the boll weevil.

It is more certain than the supply of wheat, unless we can get rid of the chinch bug.

It is more certain than the supply of corn, unless we can get more rain at the right time in the corn belts.

We have 10 years' supply of oil available in our tanks and in our proven fields at a cost that can now be determined, assuming only that labor and material costs remain the same.

Only One Pest To Fear

No pest can keep that supply from meeting the demands of the people of the United States at a reasonable cost, except the pest of the pseudo-scientist, who continues to agitate the public mind with groundless fears of an early exhaustion of our oil.

What other industry can say that it has a 10 years' supply of its products necessary to meet demand at any cost?

The farmer cannot guarantee you an ample supply of wheat, or corn, or beef, or cotton for any one of the next ten years at any price he can now determine.

Let us see how the petroleum industry has met the demands made upon it in the past: In

1875 we produced 8,000,000 barrels of oil.

1895 we produced 50,000,000 barrels of oil.

1915 we produced 280,000,000 barrels of oil.

1925 we produced 750,000,000 barrels of oil.

Our rate of production has increased 300 per cent every 10 years. And we have in our tanks today above ground over 500,000,000 barrels of petroleum and its products.

Another way to put it. During this 50-year period, supply has exceeded demand by 500,000,000 barrels, and today our current supply is so far beyond the current demand for essential purposes, that the industry is forced to market in excess of 300,000 barrels of its products daily in competition with coal.

There will come a time when current supply does not meet current demand. When that time comes, it should occasion the public no alarm. It will probably be of short duration.

Under-production will bring us high prices and high prices will again bring us over production.

It is to be expected that the first half of 1926 will show current supply of crude oil less than current demand, and competitive bidding for this reduced supply will cause higher prices.

The public should keep in mind, however, that this will not mean an under-supply of oil for its essential uses, but only an under-supply of oil for the non-essential channels into which it has been going.

The law of supply and demand, operating through its price factor, will again result in an over-production of oil and will reduce prices for essential uses.

Over-production is a condition the public should never worry about, though the industry may.

It is truly the best, if not the only protection the public has against higher prices, and I am not sure that over-production is an unmixed evil for the industry. It will eventually lower the costs of production.

Gentlemen: Regarding the future supply of oil, my answer to those who fear the early exhaustion of our petroleum supply is that there is a visible, measurable supply of petroleum, available to the people of the United States at determinate cost, sufficient to meet the demand for internal combustion fuel and lubrication for centuries to come, probably as long as our civilization and its necessities for petroleum shall exist.

Overcome Competitive Drainage, He Urges

By Earl Oliver
Petroleum Geologist, Ponca City

WE find the instability of the petroleum industry, in so far as human agency was involved had its inception back in 1875 when a Pennsylvania jurist initiated the idea that soon became crystallized into a principle of law; namely, that ownership to oil and gas becomes vested by the act of reduction to possession, as distinguished from ownership in place which characterizes most other types of property.

All down through history until within the memory of men now living this particular material, petroleum, was practically unknown, or where known was of such little application as to be no great factor in the life of the people. Its source of deposition, its accumulation, its coming and going were all matters of mystery.

Little was known regarding the laws of its generation or of its control. It was difficult of identification. It was of such nature and character, and was found under such peculiar conditions as to make difficult the application to it of the usual type of ownership characteristic of private property generally.

This principle of law, initiated in 1875, was an abortive principle conceived by an opportunist. It violated centuries of experience as to the type of ownership to property that best serves mankind. It conflicted with economic law. It put a premium upon wastefulness rather than efficiency. It was a black sheep among legal principles. It did not harmonize with existing institutions. It did not utilize the predominating traits of human nature without which no law can be economically successful.

However, for a time it persisted. Out of it grew practices, usages and customs of the industry. Finally courts began to recognize its inconsistency and gradually broke away from it until now, of the great number of courts that have passed upon it, all but those of four states and the Federal courts have repudiated it.

Tracing the instability of the oil industry back to the principle of law established in Pennsylvania in 1875 to the effect that ownership to oil and gas becomes vested by the act of reduction to possession, as distinguished from ownership in place which characterizes most other types of property, Earl Oliver, producer and geologist of Ponca City, Okla., showed how the present trend of legal opinion is to regard the principle that ownership exists to oil in place.

Recent Decision

The Supreme Court of Arkansas in a recent decision stated the present tendency of the law to be: "According to many writers on this subject, the view most generally entertained by geologists at present is that gas and oil

—Underwood & Underwood
Earl Oliver

are not of a vagrant character and do not migrate, but maintain their status until they are drawn out or expel themselves by pressure through artificial openings in the surface, and that tendency of later decisions is to hold that oil and gas, while in place and before being drawn out by artificial openings, are as much a part of the reality as fixed minerals, such as coal or iron."

This appears to substantially set forth the position also of Kansas, Michigan, Minnesota, Oklahoma, Tennessee, Texas, and West Virginia, and probably Louisiana.

Not Taken by Industry

However, the changed attitude has not yet made itself felt in the practices of the industry, nor in fact has it been carried to its logical conclusion by the courts themselves. If full force were given to the principle that ownership exists to oil in place, then it follows courts and legislatures would do those things necessary to enable the owner to reasonably enjoy that which he owned.

Certain practices and usages of the industry growing out of this early Pennsylvania decision remain as an aftergrowth that is difficult to break through. Men have experienced them so long they now claim them as vested rights, notwithstanding they are entirely inconsistent with underlying principles of the use and enjoyment of property which have persisted for ages and which are in fact the basic principles on which organized society is founded.

These errors die hard. In some cases they have been maintained as a continuity of policy. They have even been defended by bold and baseless assertions, but they now give promise of becoming the subject of parliamentary compromise and I have no doubt they will at last be swept away and repudiated. Obviously the wisdom of 1875 is become the folly of this generation.

Unstable and Wasteful

The oil industry is unstable. It is wasteful. But these admissions should cause no embarrassment to the petroleum industry, unless, of course, it refuses to help free itself of them. The practices it employs are the natural consequence of the type of ownership, Government foisted upon it. If embarrassment exists anywhere it should be that of Government, not industry.

But the agencies of Government responsible for it have long passed away and it is but fitting their successors of this day, Federal or State, both through courts and legislatures should endeavor to remedy the errors of their predecessors. In fact the aftergrowths of those errors cannot be broken through without the cooperation of government and industry, and this Federal Oil Board is a most fitting tribunal to determine the way Government in its several branches, state and federal, can best function in cooperating with the industry to bring about a correction of those errors.

The direct effect of the practices which have grown out of the old Pennsylvania principles, and which yet persist, is that, first, they operate to prevent large known reserves and second, they impel wasteful exploitation of that which is developed.

Speaking first of reserves. The known already definitely located supply of petroleum in the United States to be produced under present methods, stated in terms of 1925 consumption, is variously estimated in amounts ranging from the equivalent of 3 years' to the equivalent of 7½ years' supply. The most optimistic estimates do not place it above the equivalent of 7½ years. I am disposed to favor the lesser estimate.

Beyond this equivalent of 3 to 7½ years' supply we are dependent upon new discoveries, imports from foreign countries, and substitute methods and products.

New Discoveries

Regarding new discoveries, the man who positively states they will decline to the danger point in five years or ten years or 20 or even 40 years is obviously making an assertion on a matter on which he is in no position to do other than prophesy.

On the other hand, that man who positively states new discoveries will not decline to the danger point in the same time is to a like degree prophesying. Of the two prophesies the latter is the more dangerous. The nation will not be seriously endangered through an overestimate and overconfidence.

Both these prophets are guessing. No man can tell with certainty, and therein the danger lies. We can, however, know positively and state as a fact that no man knows how much or how little oil beyond the equivalent to a 3 to 7½-year supply exists in the United States extractable under present methods.

We know also how rapid could be the decline in our daily supply if new discoveries were to become infrequent. On May 30, 1925, the daily oil production of the United States was 2,348,000 barrels. Today it is 1,916,000 barrels. Over 8 months there was a steady decline amounting to 432,000 barrels, or at the annual rate of 27.6 per cent.

The Search Went On

During that period the oil companies were not inactive in their attempts to make new discoveries. On the contrary they were active and vigilant—but not to the same degree they will become should this rate of decline continue for another 8 months or more.

Thus a 27.6 per cent rate of decline took place nothwithstanding much drilling continued and considerable new production was developed to offset the decline in the older wells. With higher prices the search would be more intense, but it does not follow that the search would be more successful in proportion to its intensity.

I do not anticipate the present decline forecasts an early shortage. I believe it to be only one of those lulls between overproductions and expect we shall have many more overproductions before the permanent decline begins. Not withstanding this expectation we have no certain knowledge there will be another one. It is as uncertain as the life of man. That there will come an end we know. What day or year it will come, no man knows. It is not in that class of things wherein coming events invariably cast their shadows before them to a degree that will permit delay in preparation until those shadows appear.

Must Protect Future

Since we realize how rapid the decline can be, and also that we can never determine which is to be the permanent decline until frantic efforts to find new pools will have failed and the shortage be discovered by its presence, it is quite clear it would not be the part of wisdom for the nation to continue its present system of strenuously depleting each pool immediately upon discovery and yet delay preparation for providing adequate substitutes until the shortage is known to be upon us. Years will then be required to develop that for which only months can be spared.

If, however, the industry were able to overcome the competitive drainage difficulty the known unmined reserves would perhaps be gradually built up until the danger I have described would not exist. In that event production from known reserves could be speeded up to meet a threatened danger.

Under present competitive drainage conditions production from known reserves, on the contrary, is always kept

speeded up to the maximum practical limit. This occurs during times of great overproduction. So much for the known supply. The nation is incurring inexcusable risks unless it either makes possible the building up of known unmined reserves, or on the other hand develops substitutes much beyond the present experimental point so that they can immediately assume the burden when called upon.

Waste Occurs

The practices growing out of this 1875 principle serve to promote waste in the petroleum industry as follows: In the first place, oil and gas are usually found more or less associated together, confined in porous sandstones or limestones under enormous pressures ranging from 200 to 1500 pounds per square inch, proportioned usually upon depth.

If the reservoir rock be sand the spaces occupied by the oil and gas are minute interstices between the grains, usually so small as to be incapable of perception by the naked eye, and yet which may range from nearly zero up to 35 per cent of the total bulk.

It is now rather generally accepted, if the pore space of the sandstone containing oil is not greater than 10 per cent, it will not give up oil under present methods with sufficient rapidity to be rated commercially productive. Porosity in excess of the percentage named is assumed to give up oil readily. But even under these conditions it is now thought that, owing to viscosity and surface tension, perhaps 75 to 85 per cent of the oil originally in the sand is not extracted under present methods.

This 10, 15 or 20 per cent that is recovered, however, has, owing to this pressure, a tendency to flow out very rapidly and is soon depleted. Wells come in large and decline rapidly, usually producing more than half their total output during their first year with the other half extending over a period of many years. More than one-half the present daily production comes from less than 5 per cent of the producing wells.

This fact has become so generally accepted in the industry that in any region where lands are badly cut up, when a discovery is made, many near-by tests are immediately started although those who start them have no knowledge whether this particular discovery may be a flash in the pan or a prolific field; whether it may cover only a few acres or many miles.

A few only of the outstanding results of competitive drainage, as contrasted with petroleum development when such drainage is in some manner eliminated or regulated, might be summed up as follows: In the first place the gas is permitted to escape, increasing viscosity and surface tension of the oil and consequently very greatly lowering the amount that can be taken out of the pool, for it then flows less freely and more of it clings to the walls of the minute interstices in which it is contained.

Second, many needless dry holes are drilled. Third, many unnecessary wells are drilled. Fourth, gas is permitted to waste without use. Fifth, constant instability.

These wonderful pools of Powell, Wortham and Tonkawa should have been blessings to the industry. Instead they were curses. The whole industry looked anxiously for their decline. Their product was forced into channels of every kind and character so that it might be exhausted. On the other hand, Rainbow Bend and Reagan County never were regarded as menaces. During overproduction periods their oil was held back awaiting the time it could be utilized to better advantage. They were real reserves.

Must Bring Remedies

All of this discussion is useless unless it leads toward some means by which these evils I have described can be overcome. Realizing as we do in this day the importance of petroleum to this nation, the uncertainty of the supply and the wasteful manner it is being developed, it is inconceivable that the petroleum industry will rest content without determining some manner in which these evils can be overcome without at the same time bringing upon itself and the nation evils more objectionable than those from which it seeks to escape.

It is also inconceivable that representatives of government entrusted with a nation's welfare will rest content until this result is accomplished. We have confidence both government and industry will meet the issue squarely. Many means will be suggested, many will be found impracticable, but out of the consideration given to the problem both by the industry and the government some good must come.

Up to this time we find the evils have developed and become perpetuated because we have attempted to apply to petroleum, principles of law and practices unfitted to the nature of the products. It might be well now for a time to forget what we want, and study what petroleum must have according to its peculiar characteristics in order that it may be conserved and utilized efficiently.

Many Engineering Principles

We must first visualize the fact that this is a highly mobile product, confined under great pressure in very large containers frequently miles in extent with right on the part of individuals to puncture those containers and draw off the product. It should be visualized that every time one individual punctures that container he immediately modifies in a large way the fortunes and values of every other individual with a like right.

Progress will be made if we regard the emptying of that container as one big engineering problem, determining how this peculiar product contained and confined as it is under high pressure can be removed as needed and retained until needed.

We all know this should be done. The more difficult question is, how can it be brought about? Constant education on the part both of the industry and the government will help, but in addition there will perhaps be necessary some measure of legislation to make such a degree of cooperation workable.

Questions Air or Water Flooding

At the close of his formal paper Mr. Oliver discussed briefly some of the points brought out by J. O. Lewis as to oil left in the sands after wells have ceased to flow or respond to pumping, being a reserve, that might be made available through water flooding, use of air or gas or perhaps some other method.

"Most of the wells representing an estimate of eight billion barrels left in the ground that might be abstracted by this method are wells already plugged and abandoned, so they are not available for this type of use," Mr. Oliver said.

"Then it was recalled that there were 20,000 wells now being operated under this method and yet of this 20,000 wells there were only 10,000 or 15,000 barrels per day of production. That is a large amount of oil. I do not mean to belittle that because it is valuable and it is going to grow in importance.

"But there are 20,000 wells producing 10,000 or 15,000 barrels per day and our daily production is 2,000,000 barrels. So it is very insignificant as compared with our needs and many of the wells to which it might be applied are in such condition that we could never apply it.

"My own impression, from such experience as I have had with flowing wells—and most of you gentlemen have no doubt had the same experience—is that, at the period in the life of a well when it is just about ready to quit flowing, you can do certain things to it. Sometimes we put in tubing and a packing and make it flow in that way. It prolongs the flowing life but it does not add a great amount of oil. It is just one method of prolonging life slightly.

"Mr. Lewis stated that these wells with 700 or 800 barrels initial production had gotten down to almost nothing and by the application of air they got them up to three barrels. Now, three barrels as compared with 750 barrels is not much. It is important but it is not one of the things that we would want to depend upon as a reserve."

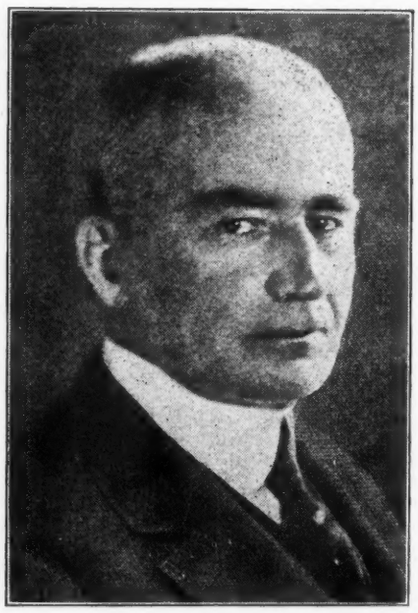
Federal Oil Conservation Board Hearing

More to Fear From New Power Sources Than Exhaustion of Supply

By J. Edgar Pew
Vice President, Sun Oil Co., Dallas

That the public or the nation has nothing to fear from an oil shortage was the theme of the address by J. Edgar Pew, vice president of the Sun Oil Co., Dallas, and past president of the American Petroleum Institute. He discussed possibilities for additional supplies through deeper drilling, from new oil territories and also substitutes. He pointed out what the industry has accomplished through its own initiative in reducing losses and improving its operating technique.

He suggested the advisability of the government building up a reserve of its own of say 100,000,000 barrels by buying oil at the proper times.



—Underwood & Underwood
J. Edgar Pew

PETROLEUM oil has been produced in commercial quantities in this country since 1859, during which year 3000 barrels were produced.

In 1890 the production was 45,000,000 barrels; in 1900, 63,000,000 barrels; in 1925, 750,000,000 barrels. The total production up to January 1, 1926 was about 8,500,000,000 barrels.

The methods of finding and handling this oil and its products, from the drilling of the wells to the delivery to the consumer, have been steadily improved, until today the oil industry as it is operated, is a highly specialized one, and is probably as scientific in its operations as is any great industry.

As is the case with any other modern industry of its magnitude, improvements are always being developed. Research within the industry is being conducted in all branches of the oil industry and on a scale little known to the public. Millions of dollars are annually being expended by the larger units of the industry. Within the past three months the American Petroleum Institute has received $500,000 to be spent at the rate of $100,000 per year on research work for the benefit of the entire industry. This all benefits the public, dependent on our products.

New Developments Many

New developments in the science of discovering crude oil, during the past five years have done more to enable this industry to supply the present great demand for its products than any other factor of the industry. New developments in manufacturing processes have added greatly to these results.

Wells producing oil from a depth of 3000 feet were scarce as late as twenty years ago. Any depths materially greater than 3000 feet were, at that time, not considered practical to drill, or to operate if such deeper oil did exist, which was then considered improbable.

We are now producing large quantities of crude oil at depths below 5500 feet, and some oil from as deep as 7200 feet. The experienced oil producers, backed by their geologists' opinions, believe that we may produce oil from as great a depth as 10,000 feet and from even greater depths. New and better equipment and methods of drilling and producing oil make such predictions seem possible.

Today we are producing about 2,000,000 barrels of crude oil daily and, with the present scientific methods of determining possible producing areas, the future production of crude oil appears to be largely limited by its cost of production and by a cost that will permit its delivery to the public in competition with known substitutes that have been developed, and are being developed, which will take the place of petroleum oil products *when their costs of production and manufacture are sufficient to permit this competition.*

Deeper drilling, more intensive recovery methods, and the exploration of the vast unexplored areas, where the formation of the oil producing variety is known to exist, would seem to make these results reasonably certain, as to a continuation of our oil supply.

Uses of the products of oil by the public, have changed. Kerosene and lubricants were the principal products marketed up to 1900. A comparatively small amount of gasoline was made and sold from 1890 to 1900.

The advent of the automobile entirely changed these conditions. Now, gasoline and lubricants, together with an ever-changing quantity of fuel oil, are the principal products manufactured and sold.

With the changes in requirements, have come also changes in manufacture. Where five to ten per cent of gasoline was made from crude oil in 1900, now there is made an average of nearly 35 per cent of gasoline, and from some crude, and by some processes of manufacture, a very much greater percentage can be and is being made.

The oil industry has always responded to the demand in supplying the public with its requirements, not only in quantity, but in the particular product required. It has done this as efficiently as any other industry, and at prices relatively less than that of any other great industry. It has done this even in the face of continued predictions of the experts that we had reached the maximum of our production and that the future had little to promise for the continuance of a sufficient supply.

Industry's Methods Improved

Cracking processes are being perfected and put into use as fast as practical conditions, such as the supply of crude and the market for its products demand and justify. There will be a much larger recovery of gasoline when these conditions permit.

Deeper drilling has revealed what amounts to new fields of production, even in the areas already drilled and considered once as exhausted. It is well known among the experienced oil producers that these deeper sands are more productive and that, also, they contain a higher grade of oil.

New methods of drilling and producing, better equipment, and a better knowledge, scientifically of oil-bearing conditions have added to our assurance of an ample supply not only from these deeper areas, but has also made possible vast new areas of production which are as yet practically unexplored.

There remains to be explored for oil many times more acreage than has yet been developed. The possibilities of production from deep drilling on the present developed acreage and in the new unde-

veloped areas, increase this prospect to a great extent.

It is never safe to predict as to the future of oil production. It is an industry definitely based on "finding," without any certain knowledge until found that oil exists. It is also as true, that within certain areas, and this includes more than one-half of the entire area of the United States, there may be found oil pools; and, until this vast area has been fully explored, it is just as unsafe to say that oil may not be found as it was to make the prediction referred to.

The precedent and experience of the industry are entirely in favor of the opinion that sufficient oil will be found, rather than that it will not be.

Waste Is Decreasing

The oil industry is one dealing with a volatile product, and one susceptible to losses. Since the beginning there have been wastes in the production and manufacture of oil. This has been in an ever decreasing degree, and today, except in the districts where these economies are impracticable, there is but little loss, either in the production of oil, or in its handling thereafter. These economies are the result of better methods, and better markets for all the products. They are now a financial necessity to any operator in order to get his profit required to meet competition. Many of these economies were unknown a few years ago, or were impossible because of the lack of discoveries and inventions at that time, but which now make the present conservation possible.

In its operation the oil industry has had to sell part of its product for what has been called inferior purposes, and to a certain extent continues to do so, in the case of fuel oil. This is and has always been a necessary practice, and I believe furnishes a useful and practical outlet for products, required to make the business sufficiently elastic to meet the requirements of the public. In many instances fuel oil is a public necessity, as in California, and in many of the interior states. Fuel oil furnishes an elasticity to the oil industry, and when the occasion demands, temporarily or otherwise, this product can be converted into gasoline.

Another protection the public enjoys for its future oil requirements is the enormous supplies of substitutes which can be obtained from shale, coal, and other sources that will do the same service, when and if the crude oil supply fails, wholly or in part. These sources are known, and are only awaiting development because of the abundance of supplies of crude oil, which, because of their cheapness, do not stimulate the development of these substitutes.

A still further protection to the public lies in the development of the savings in the use of oil products. The automotive engine manufacturers advise us that they can perform the same service by making engines that will do the same work on one-half the present gasoline requirements, and that probably this saving can be much further increased. This can only be done when the public wants to use this character of engine. At the present price of gasoline there is no such demand.

Governmental Requirements

As to the industry's relation to the government in supplying the necessary emergency needs of the government for oil in time of war, it is hardly conceivable that any emergency should arise that will call for a greater reserve than is normally held by the industry. Also if, and when such emergency should arise, there is the known production which today amounts to about 750,000,000 barrels per year, the uses of which can be curtailed to such degree as may be necessary to meet the emergency requirements of the government.

If this assurance is not sufficient for the protection of the government it could, and from an economical view might well build up its own reserve, of storage stocks for emergency demands, by buying oil at the proper times. In this manner the government could save money on its purchases and could create a reserve of stocks of—say—100 000,000 barrels. These would not necessarily have to be located at any particular point, as methods of transportation, or exchange could easily be worked out.

The oil industry, in the opinion of many, has more to fear for the future from competition, either by products from substitutes, or by the use of other sources of power not yet developed, than it has from the exhaustion of oil supply.

Rational Co-operation Is Need of Hour

By Mark L. Requa
Mining Engineer

REDUCED to its simplest fundamentals, the petroleum problem may be stated thus; rational co-operation between the government and the petroleum industry, to the end that production will at all times balance consumption as near as may be with due regards to adequate reserves above ground to meet temporary deficiencies caused by lack of flush production.

Bringing about this condition is, however, not an easy matter. It involves elements that are fundamental in our form and theory of government.

Consideration of both national defense and public welfare demands most efficient use of our petroleum resources; in other words, conservation of the wasting asset, to the end that the public will derive the greatest benefit, and over the longest period of time.

Investigations under the direction of the American Petroleum Institute have developed the following:

(1) 5,300,000,000 barrels of oil in reserve in the known oil fields to be produced by flowing and pumping methods.

We have, therefore, known oil in the United States sufficient to last about eight years if consumption does not increase and if we could get it all out in that time. The consumption will increase and we cannot get it out in eight years, so new discoveries are imperative. It is true estimates have been made showing that 26 billion barrels will eventually be recovered by methods now largely unknown. Admitting this to be true, it might be enough to last one generation if it could be extracted in that time. In our national life, a generation is a very limited period. The facts point to the necessitv for most efficient use of what we have, be it six billion or 26 billion barrels; they spell conservation.

(2) About half our production is burned as fuel. That is too much. I do not attempt to set the limit that should be the dead line, but I do say the burning of perhaps 75 million barrels of gasoline, 50 or 60 million barrels of Diesel engine oil and 20 million barrels of lubricating oil as fuel is without justification, save on the ground that co-operative action to control production is not perhaps legally permissible.

(3) Five per cent of the wells produce one half of the oil, in other words, flush

The present status of raw materials of all kinds in this country from the standpoint of the government demands a conservation policy, Mark L. Requa, mining engineer and head of the oil division of the fuel administration during the war, told the oil board and oil men attending the hearing. He said this should come about through cooperation between government and industry, rather than regulation, which, he said, was the penalty of monopoly.

He referred to the new policy of cooperation on the part of the government as benefiting government, industry and the public, and said its working out would be gradual. Specifically, he said the government should carry out a program of conservation which would insure its carrying at all times a reserve of 100,000,000 *barrels as army and navy navy reserves.*

production accounts for one half of our total. The importance of continually bringing in new pools is clearly demonstrated by these figures. How long new pools will continue to be found no man can say. Basing any national policy upon the assumption that such discoveries will continue is folly.

(4) There is no known satisfactory substitute for petroleum from wells. I am not unmindful of the possibilities of oil from shale or coal, nor overlooking other known substitutes. Chemistry may find, sooner or later, substitutes that are satisfactory, viewed from both the standpoint of quantity, quality, and price. But we cannot found a national program or policy upon what may be discovered in the future.

It would be folly to maintain that such discoveries were impossible, or highly improbable, but it would be even greater folly to attempt to predicate present day governmental action upon any such vague hypotheses. It will be time enough to alter the policy of government after a satisfactory substitute has been found.

Army and Navy Reserves

Nor am I unmindful of future supplies to be drawn from foreign sources. These, however, do not satisfy the domestic situation. What we should be primarily concerned with is our domestic reserves. We must at all times be prepared, insofar as possible, to supply from domestic sources petroleum products sufficient to meet any national emergency. For such purposes, we certainly cannot rely upon foreign sources of supply.

The government should carry in steel storage, at suitable points, not less than 100,000,000 barrels of petroleum as army and navy reserves. It is an American policy that will far more than repay its cost; that it has not been done long ago, is without excuse.

No one can estimate the quantity of petroleum yet to be produced from our unknown oil fields, therefore, the only policy that can be adopted, with safety, is rational conservation of what we may produce from year to year.

It is the working out of this policy that affords the industry its opportunity of public service.

I believe there is much that can be done by co-operative action that will be highly beneficial to both the public and the industry. What the industry must do is to develop that program and present it to the government. It may be, and probably will be, worked out piecemeal and over years; but, if put upon such a foundation, I am of the opinion the harassing annoyance of futile Congressional investigations will be a thing of the past and the industry can live in peace, and perform its public service without interference. An experience that would be quite as welcome as it would be new and novel.

The industry cannot in full measure perform its public service without the co-operation of the government. The

—Underwood & Underwood
Mark L. Requa

obligation therefore is twofold. The relationship should be co-operative and not regulatory, for the reason that the industry is not monopolistic.

Government supervision and control is the penalty of monopoly. That monopoly under certain conditions best serves public need is but added proof that supervision and control under such conditions is necessary. Unless whatever action is taken is based upon sound economic principles, it will fail; therefore any type of government ownership and operation is worse than useless. That there is no such thought expressed in the letter of the President or by the members of the Federal Oil Conservation Board is refreshing relief from a deluge of impractical suggestions with which Washington has been flooded in recent years.

Many people visualize conservation as designed to lock up our national resources and to become 100 per cent effective over night. This is absurd. Conservation is rational and efficient use of our mineral raw materials over the longest possible period of time. It must make possible a better service over a longer time than is possible without it. Any attempt, for instance, to prohibit over night the use of fuel oil upon the Pacific coast would result in industrial chaos, would be without the slightest justification and the very antithesis of true conservation, which is synonomous with public welfare.

The industrial age now little more than a century old has created demand for mineral products in undreamed of quantities. The world now in one year consumes more mineral raw materials than in the first eighteen centuries. Our own consumption of these products doubles roughly every 15 to 20 years. In the case of petroleum, it has been much more rapid. Twice 100 million barrels of petroleum is very different than twice 750,000,000, and incidentally, we have a depleted reserve from which to draw the larger quantity. We deal with increasing demand and diminishing supplies.

Depends on Minerals

Modern civilization is built upon ample supplies of mineral raw materials. With their exhaustion, civilization as we know it today must collapse, and population must enormously decline due to starvation. I am not unmindful of what science may develop in the future, but we cannot today found any national policy upon the assumption that scientific discoveries will supply our future demand for minerals from sources now undiscovered.

A great part of the perplexing problems of England to-day have their origin in lack of mineral raw materials at low price. Europe in 1914 went to war in part because of minerals. We, of all nations, are most bounteously blessed with these resources, yet there are some very important ones we lack. We consume half or more of the world's production of minerals. This very profuseness of supply has caused the demand; it is the foundation upon which our greatness as a nation has been built.

Of copper our mines contain a supply that will not last another 60 years. There has not been a new copper mine of first magnitude discovered in the United States in the last quarter of a century. The last great gold and silver camp was Tonopah goldfield about 1900.

The whole aspect of our mineral raw materials from the standpoint of government demands conservation. It is a program that will not be completely developed save over years. The petroleum industry here in Washington on Feb. 10th and 11th, 1926, has had the honor, in my opinion, of setting the first foundation stone in the new structure of co-operative relationship between government and industry as related to mineral raw materials.

The President in his letter appointing the Federal Oil Conservation Board said, that "government and business can well join forces to work out this program of practical conservation."

I believe this to be true. I see in the future a solidarity of effort and continuing progress in place of discord, and the sporadic and unorganized efforts of the past. I am fully persuaded the new policy of co-operation will benefit alike the government, the public, and the industry. With time, the relationship will become better, understood; the details more fully developed.

With the development of that relationship, I have the faith to believe there will come an intelligent understanding of the petroleum industry both upon the part of the government and the public that will promote mutual confidence and mutual good will. In the development of such a program lies the opportunity of the petroleum industry.

Federal Oil Conservation Board Hearing

Suggests Possibility of Legislation Restricting Oil Uses

By L. V. Nicholas
President, National Petroleum Marketers Association

If it is decided that some form of conservation of oil supplies is good policy, the possibility of legislation to restrict the consumption of petroleum to superior uses was suggested by L. V. Nicholas, president of the National Petroleum Marketers Association, in his talk before the Federal Oil Board. This suggestion drew an opposing comment from H. L. Doherty.

He also suggested the establishment by the oil industry of a uniform accounting system, with uniform methods in all departments, with the segregation of each division under separate capital setups for companies operating in all branches of the oil business. The oil distributing business, he said, was one of the finest demonstrations of competition and real service to the public with minimum waste.

CRUDE oil in this country is not produced to meet increased demand, but rather over-supply has forced the industry to find new outlets through inferior uses that have built up a semblance of increased demand. This in my opinion, is a very dangerous situation, particularly if, once an inferior use has become well established, we increase our search for new crude to supply that inferior use.

Over-production is the direct result of too much fresh capital being lured into the oil business as the result of loose accounting methods that give the efficiently organized and intelligently managed companies no visible advantage in their financial statements and balance sheets over their loosely managed, highly exploited competitors who possess original ideas in accounting.

If we are ever to adopt some system of conservation it can never properly be done until the entire oil industry has first been established on a properly segregated basis of operation, as producing, transporting, refining, and distributing. The invested capital in each grouping should be carefully allocated, and each grouping or division should operate on a uniform accounting system.

Uniform Accounting Standards

Whether the consumer is best served by the present system of transportation and distribution can only finally be determined by the fearless setting up of uniform accounting standards and insisting that the industry and the public face the facts.

That portion of the oil industry which operates through the sale and distribution of petroleum products to the ultimate consumer is hampered not only by chaotic conditions that are continually arising out of the over-stimulation of the production of crude oil, but also because they are competing with business units who can and do "play" with their accounting systems, and as a result disorganize one branch of the industry at the expense of another.

One of the great nationally known oil executives said:

—Underwood & Underwood
L. V. Nicholas

"We do not particularly care in what branch of our operations a profit is made or in what branch a loss is sustained, so long as the consolidated balance sheet shows a proper and satisfactory profit."

No industry can practice even a mild form of conservation under such methods of accounting.

As to whether the consumer is best served by the present system of transportation and distribution, approached from the angle of conservation I lean to the opinion the consumer is not well served.

First: Because in the mind of every oil man is the lurking fear of petroleum exhaustion. Yet our entire industrial machinery of gathering, transporting, and distributing is geared to speed the day of possible exhaustion.

Pipe Line Control

Second: Our great pipe line, transit, and storage facilities of the industry, while they perhaps may be termed common carriers and common storers or warehousers of petroleum products, are as a matter of fact so closely controlled and operated that the industry as a whole has no real means of giving expression to its views in terms of price or the volume of products it actually wants to throw on the market, and the general public is without any means whatsoever.

No study of our conservation problem will be complete until a thorough and exhaustive study has been made of the operations of the great pipe line and storage units whose methods, in my opinion, are the greatest factor in causing demoralizing over-production. In no branch of the industry is there greater need for segregation of the different operations and separate and distinct capital set-ups and uniform cost accounting.

Approached from the angle of ease and convenience in obtaining petroleum products, with friendly, courteous service pressed down and running over, and a price that is in line with everybody's purse, the consumer is served like a king and treated to the best the world affords.

Service Without Waste

In my opinion, one of the finest demonstrations of real competition and a real desire to serve the consuming public is to be found in the distributing end of the oil business. As to waste—and by that I refer to leakage, and loss in handling petroleum products themselves—it is less, in proportion to the volume of products handled, than exists in any other industry in the world.

I believe all the complaints and criticisms aimed at service station architecture, uniformed attendants, and spic and span appearance that indicates good housekeeping, all the slurs and comments concerning the vast number of service stations, curb pumps, and oil companies operating throughout the country, are very largely the result of loose thinking by people who like to make a noise and know very little of what the noise is all about.

This thought must always be borne in mind in connection with the transporta-

tion and distribution of petroleum products; rapid delivery and a saving of time are the dominating factors.

The oil business today is largely built around the automobile. Close down even a small percentage of our present national equipment of drive-in filling stations and you would immediately slow up the business of this country to a startling degree. What saving was made in the operating costs of the oil business would be wasted many times over in nationalized loss of time.

The service end of the oil business is built to care for peak load requirements of a nation, and has no more right to be criticised or condemned for apparently vacant, unoccupied periods than we would think of condemning our railroads for hauling back long lines of empty cars after a seasonal movement west or south; or than we would think of condemning a hotel for having a room for our convenience and comfort vacant and immediately available after we have registered. That is simply service, and the highest and truest form of American ideals in service, and the average American citizen is tickled to death to pay for it.

From the standpoint of efficiency in the physical collecting, transporting, refining, and distributing of crude oil and its products, too high tribute cannot, in my opinion, be paid to this industry.

Conservation Probably Needed

The fundamental issue with the oil business is not the question of how the consumer is best served in regard to his immediate comfort and convenience.

But rather—is he best served when provided with petroleum products that he can use for inferior purposes in competition with coal, at the possible expense of later on having to go without the convenience it furnishes as a coal substitute, plus the possible inability to procure it as a motor fuel. It is this phase of the situation frankly that bothers me.

I do not believe there is anyone in the oil industry who is willing to face the facts that does not have an underneath feeling that some form of conservation may possibly be good public policy.

My personal leaning to this feeling is based on the following observations:

An apparent fear in the minds of the larger organizations or units in the industry that our supply is limited, this indication taking form in their continuous battle for control of settled crude production and their constant stimulation of the exploration and search for new production.

It seems to me this competitive battle for the control of crude reserves has become more intensive since the industry has had opportunity to study the report of the Committee of Eleven.

From way back in the very beginnings of the oil industry, one of the justifications offered for our pricing system and structure was the need for taking into consideration the hazards of the industry.

My fear is that the funds set aside by the older generation to provide for "hazards" have been thrown by the present generation into the scramble and search for more intensive hazards. Even if the financial set-ups to protect the industry against the hazards of depletion and ultimate exhaustion are ample from an industrial standpoint, would these set-ups in any way protect the ultimate consumer whose long run comfort and convenience should and must be of paramount consideration?

Suggested Methods

None of the conservation methods proposed up to date sufficiently stress the effect the present organization of the industry has on the most economically justified use of oil products. All of them deal with some method to restrict the production of crude.

All the proposals for conservation that have been made up to date—unless we were to take into consideration a tentative suggestion outlined in the National Petroleum Marketers Associations' confidential weekly bulletin several months ago—approach the conservation problem from but one angle.

All tend to increase the price of crude, with the ultimate purpose of restricting its use. Through the medium of increased price, they propose to force it into the channels of superior use.

This method is certainly not American, and I am afraid would be subject to severe public criticism on the ground that the "rich" would be able to continue to consume oil products while the "poor" would find it difficult, if not impossible.

If our petroleum resources are to be conserved and restricted to superior uses, do not let us attempt it through any medium that will drive its use into the luxury class where the "rich" can enjoy it while the "poor" look on.

Legislate As To Uses

I would suggest that careful consideration be given the idea of legislation that would force all petroleum products into superior uses, provided and if some form of conservation is decided upon. By this means we would currently produce less crude—which of course would conserve our supplies—and we would immediately end the vicious circle of stimulating the search for new crude oil to satisfy the vociferous demands of inferior uses brought into being by present over-supplies of crude oil.

In my opinion, if we had not overstimulated our crude oil production, our whole industry would have been geared to serve the consumer efficiently and well with such products as gasoline, kerosene and lubricating oil, at a fair and steady average price, and the scientific research necessary to provide our present demands for superior uses would undoubtedly have been advanced by many years.

Even with a distinct lack of urge because of comparatively continuous and over-abundant crude supply, there has been an astonishing improvement made in refining methods to increase the yield of superior products.

I believe it is conceded throughout the industry that not even half our present production of crude oil is required to supply our national petroleum demands for recognized superior uses, and that the products thrown into inferior uses contain at least 50 per cent of easily obtained gasoline and other superior derivatives.

Summarization

To summarize—I lean, and I am sure the vast majority in the industry lean, to conservation in some form or other, but I earnestly urge against any method that will base conservation on a restriction through price. That is un-American and unthinkable.

As a first step I suggest the establishment of a uniform accounting system, and the segregation of each division under separate invested capital set-ups, with uniform accounting methods in each department, particularly where the operations are all by one great company.

Quotes From Earlier Marland Speech

AT THE close of his formal remarks, Mr. Nicholas read into the record portions of an address given by Mr. Marland, on Oct. 10, 1923, which, Mr. Nicholas said, was completely the reverse of what Mr. Marland had told the federal oil board the day previous. The title of the earlier Marland address was "Can Overproduction of Crude Oil be Prevented by Governmental Regulation." Among other excerpts Mr. Nicholas read:

"A few years ago, operators might have believed that pinching in a well, or holding a back pressure on it, was detrimental to the wells. Very few experienced operators believe that today, but, on the contrary, believe that, if the wells drilled in a pool were required to be pinched in, and a back pressure kept on them, the ultimate yield of oil per acre from the pool would be greater than if it were permitted to flow wide open."

Again he quoted this remark from the close of Mr. Marland's earlier speech:

"I wish to leave with you the thought that a competent committee of oil men and oil country lawyers should now be at work attempting to find the remedy for these evils so that, should the state legislatures attempt to find a remedy for them, we will in advance have given the matter our best thought and be able to offer some suggestions, or put forth the best argument possible that we need no remedial legislation."

Pine Challenges Couzens as 30% Depletion Allowance Passes

WASHINGTON, Feb. 15

A DISCOVERY depletion allowance equal to 30 per cent of the gross income from an oil or gas well in a tax year, instead of only 25 per cent was voted into the tax reduction bill by the senate near the end of the debate while the body was sitting as a committee. Senator Neely, of West Virginia, offered the amendment which was accepted after one allowing 35 per cent, offered by Senator Goff, also of West Virginia, had been voted down.

This provision takes the place of the definition of a "discovery" well as in the bill passed by the House, and the provision for a 25 per cent depletion allowance voted by the Senate finance committee as a substitute for the House section.

The 25 per cent allowance, at the hands of the finance committee, was accepted by the oil men who had been fighting for a retention of some allowance, in the belief that otherwise the tax bill would become a law with no provision at all for discovery depletion allowance. This was the openly stated aim of Senator Couzens, of Michigan, whose select committee, with the aid of former employees of the Internal Revenue branch of the treasury, investigated the income tax unit of the Internal Revenue Bureau and gave the public to understand that the oil industry had failed to pay $450,000,000 of taxes it was liable for. On account of what is regarded as a feud between Senator Couzens and Secretary of the Treasury, Mellon, the colleagues of the former seemed not to take his arguments against discovery depletion as seriously as the Michigan senator regarded them. Senator Smoot, the Republican leader in the tax bill fight, admitted that 25 per cent might be something less than a proper allowance and Senator Simmons, the Democratic leader, said that 25 per cent was too low but 35 per cent was too high.

Pine Challenges Couzens

In the course of the debate Senator Pine, of Oklahoma, and Senator Couzens came near having a personal debate. The latter asserted that more than 100 per cent had been allowed for depletion by the companies, the excess being carried from one taxable year to another.

"I deny that it was done," said Senator Pine.

"The Senator then questions the veracity of my statement?" asked Senator Couzens.

"I do not question the senator's veracity," said Pine. "I deny that it is a fact."

Senator King of Utah added his word that depletion allowance loss was carried over from one year to another and that in that way more than 100 per cent of depletion was allowed. Senator Pine denied that, as coming from Senator King. Thereupon Couzens charged that Pine was practically asserting that the three senators who signed the Couzens committee report were telling an untruth. Senator Pine sought to explain, but Senator Couzens said he did not think he ought to yield to him.

"I do not think I should yield to a man who impugns the reputation or character of a committee that has made a thorough investigation, and who is so ignorant that he has never even been through the bureau to know anything about it," said Couzens.

Senator Neely came into the chamber just in time to hear the Michigan senator call Senator Pine ignorant, and invoked the rule requiring a senator to quit talking if and when another senator called him to order for transgressing the rules of the senate.

Senator LaFollette who was presiding told Senator Couzens to sit down. After the offensive language had been read by the reporter, Senator Willis of Ohio made the customary motion allowing Senator Couzens to proceed "in order" and it was agreed to. Senator Couzens was not satisfied with the status of things, so he wanted to know whether it had been ruled that he was out of order and in the course of this inquiry he observed he was not certain whether the senate thought it worse to call a senator a liar than it was to call him ignorant.

Senator Cole Blease, of South Carolina, made a point of order against the Michigan senator for that observation, but did not insist upon it; suggesting that Couzens go on with his speech and let the personal matter rest, adding there was another place where they could settle that, thereby bringing out a laugh.

The whole thing was in the nature of a tempest in a teapot, but it indicated a tenseness of feeling on the part of senators interested in the discovery depletion matter with regard to the character of the investigation Senator Couzens had been making and particularly the nature of the newspaper reports concerning it.

New Depletion Provision

The depletion provision as voted into the bill is as follows:

"In the case of oil and gas wells the allowance for depletion shall be 30 per cent of the gross income from the property during the taxable year. Such allowance shall not exceed 50 per cent of the net income of the tax payer (computed without allowance for depletion) from the property, except that in no case shall the depletion allowance be less than it would be if computed without reference to this paragraph."

Senator Reed of Pennsylvania, quoting figures prepared by the treasury, from the settlements made with 50 oil companies, said the average depletion allowance in 1918, was 32 per cent; in 1919, was 41.76 per cent and in 1920, 37 per cent of the gross income, or an average of 37.75 per cent. Those were the allowances made by the treasury in the settlement of cases. He said the same 50 companies claimed allowances in 1921 averaging 56.20 per cent, but he said those claims were not yet audited, wherefore it could not be said how much the allowance would be. In 1921 the law was changed to limit depletion allowance to 100 per cent and in 1924 to 50 per cent of the gross income.

Senators Goff and Neely of West Virginia, Harreld of Oklahoma, Couzens of Michigan, Pine of Oklahoma, Smoot and King of Utah, and Reed of Pennsylvania, the latter in charge of that particular part of the bill, discussed the allowance provision. The discussion of the senator from Michigan consisted mainly of reading excerpts from the the partial report of his committee and a proposition that, if the senate was determined to make a gift to the oil industry, it had better be in the form of a percentage of the net income than in the form of a percentage of the gross.

Senators Reed and Neely, the former supporting the 25 per cent proposal and the latter trying for a higher percentage, were unable to agree as to what the independent or small operator needed, the former insisting that 25 per cent was enough. On closing Senator Neely said:

"The 25 per cent is thoroughly satisfactory to the multi-millionaire operators, because their production is what is termed "settled production." They suffer little depletion. But every independent operator in West Virginia, Pennsylvania, Texas, Indiana, Louisiana, and California knows that the life of his business demands more than a 25 per cent depletion allowance.

"I implore the Senate to give the 'wildcat' operator and the courageous explorer a chance. They hazard all their capital every day and all day long. Neither their taxes nor their burdens should be increased.

"But since the 25 per cent depletion allowance provided by the bill is less than the average depletion heretofore allowed by the Bureau of Internal Revenue, the effect of the bill, if passed in its present form, will be to increase the taxes of every independent oil and gas company in the country, and to put many of them entirely out of business."

The thirty-five per cent amendment was rejected by a vote of 32 to 31. It showed that the 30 per cent amendment would be accepted, as it was by a vote of 35 to 29. Senator King of Utah, one of the three signers of the Couzens committee report, referred to as a special committee, immediately after the rejection of the 35 per cent amendment and before the acceptance of the 30 per cent provision, charged gross favoritism to the oil industry, he said:

"No other industry or business has been so favored in the matter of taxation as has the oil industry. It is not my purpose to examine the law and the

(Continued on page 64)

A New
POSITIVE LARGE VOLUME
Meter
will soon be available for measuring gas

Oklahoma Production Again Increases But Still No New Fields In Sight

By A. F. Hinton
N. P. N. Staff Writer

TULSA, Feb. 13

ALTHOUGH Oklahoma production has been increasing for the past three weeks, the gains have been relatively small. It is noteworthy, too, that the increases have in most cases been due to the drilling in of good wells in, or adjacent to, proven fields, and have not come from wildcat or even semi-wildcat wells which might lead to the development of important fields with bearing on the state's crude market.

In other words, the crude situation remains very strong, in spite of these small increases in production, and apparently will continue in that condition as long as no new fields are brought in. High gravity crude is in keen demand, while no crude of any gravity goes begging. Premiums are still being paid by refiners, the battle for connections between the premium-paying refiners and the big purchasers having continued unabated after the recent raise in crude prices.

Champlin Refining Co. again gained prominence the past week when it still further increased the margin of its offered crude prices over those of the Prairie Oil & Gas Co. and other big buyers. Impelled by the necessity of obtaining more connections in order to assure itself a supply of high-gravity crude, this company added another 10 cents to its schedule, making its prices 25 cents above the market. The company explained that it was forced to take this step by Sinclair's action in demanding a 25-cent premium for the Garber crude it sells. The rapid decline of Garber and other northwest Oklahoma fields has rendered the competition for crude in that area exceptionally keen.

Mid-Continent Petroleum Corp. apparently has not been deterred from its policy of offering proration-proof contracts at premium prices by the upward swing in the crude market, and is said to be still paying from 10 cents to 25 cents over the posted market price for certain grades of crude it desires. It is apparent that further crude advances must be made if the big companies are to make an earnest effort to retain their field connections. It would not be surprising if another advance should occur before this article gets into print.

New Territories Likely

As the frontier of oil production in Oklahoma moves to the south and to the west, covering, as it has in the past few years, territory theretofore looked upon as impossible but afterward proven to be highly productive, all the outlying parts of the state in those directions are now viewed as likely-looking and are rapidly being leased up. This busy leasing campaign of course is being prosecuted with more diligence in some sections than others, but the great open spaces as a whole are being gone over carefully.

From Seminole county west to the Texas line and north to the Kansas line is now the scene of a great leasing campaign which will be followed almost immediately by enough drilling to insure thorough testing of large areas. Many companies are "checkerboarding" whole counties for protection, while others are taking leases in large blocks where possible and where geology indicates a favorable play. When taking leases by the checkerboard method, the companies try to get from four to seven leases in each township, and pretty well scattered over the township. These are not taken on geology but are taken when the prices for leases are reasonably low to assure the company that its holdings will be somewhere in the vicinity of any wells drilled in the county.

One of the most intensive leasing plays now going on is in Kingfisher county, lying south of Garfield, in which the Garber field is located, and on the "trend" which some day may develop another prolific field such as Tonkawa or Garber. Kingfisher county underwent a leasing campaign about 10 years ago, shortly after the Garber field was discovered but nothing came of it and the leases were allowed to expire. At that time only the shallower sands were being drilled and the rich potentialities of the Wilcox horizon in the northwest Oklahoma area were undreamed of.

The Oklahoma Panhandle country, especially Texas county, also is being leased up thoroughly and is also getting considerable drilling. This county is the middle one of the three that comprise the long narrow strip formerly known as "No-Man's Land" in the days when the area has not been definitely allocated to any state or territory and was a harbor of refuge for desperados from all over the southwest. Among companies having either large blocks or checkerboard acreage in Texas county are Amerada Petroleum Corp., M. M. Valerius Oil & Gas Co., Sinclair Oil & Gas Co., Mid-Continent Petroleum Corp., Roxana Petroleum Corp., and Marland Oil Co.

More New Tests

Wilcox Oil & Gas Co. is drilling its No. 1 Zea, in the SE¼ of 28-3-13E and is now down to around 2000 feet. The same company also is drilling its No. 1 Hovey, in the SEc of 21-4-14E. M. M. Valerius is drilling on the J. T. Hughes block in the SW of 18-3-12E, and has derrick up for a test in another large block of acreage 10 miles north. Reiter-Foster Oil Corp. has a rig up on the Frank Frantz block in the SW¼ of 9-3-15E. The only completion in the county so far is a 15-million cubic-foot gas well in the SW¼ of 4-1-12E, drilled by Garber & Pulse of Enid on a large

Drilling Operations in Oklahoma, Kansas and North Texas

	Feb. 13 — Week Ending —					Feb. 6				
	Loc.	Rigs.	Drg.	S.D.	Total	Loc.	Rigs.	Drg.	S.D.	Total
OKLAHOMA										
Burbank	...	5	12	...	17	...	3	10	1	14
Other Osage	2	7	44	13	66	4	11	40	14	69
Bristow-Cushing	30	32	166	29	257	26	31	168	33	258
North Oklahoma	11	32	139	87	269	13	33	137	101	286
South Oklahoma	19	30	126	40	215	18	24	134	40	216
Muskogee	...	14	44	11	69	...	9	37	16	62
Okmulgee-Bristow	2	45	100	33	180	2	54	91	32	179
Tonkawa	1	1	4	1	7	...	...	7	2	9
Wewoka-Cromwell	16	17	101	27	161	11	13	107	33	164
Total Oklahoma	81	183	736	241	1241	76	178	731	272	1257
KANSAS	68	101	230	135	534	70	89	215	158	532
NORTH TEXAS										
Eastland County	...	2	39	5	46	...	3	29	5	37
Stephens County	...	19	31	12	62	...	17	34	9	60
Texas Panhandle	...	29	59	15	103	...	20	55	16	91
Mexia District	...	1	6	1	8	...	1	6	1	8
E. Tex. Wildcats	...	3	8	12	23	...	3	8	12	23
W. Texas Wildcats	...	27	131	105	263	...	26	160	86	272
Wichita Falls	...	91	157	46	294	...	79	176	35	290
Total N. Texas	...	172	431	196	799	...	149	468	164	781
GRAND TOTAL	149	456	1397	572	2574	146	416	1414	594	2570

Completions in Oklahoma and Kansas, Week Ended Feb. 13

OKLAHOMA

Caddo County

Company	Well No.	Location	Depth	Initial Production
English	2	SEc 31-6-9W	2285–2309	100
Diamond	1	SWc NE 12-50-9W	T.D.2372	Dry

Carter County

Company	Well No.	Location	Depth	Initial Production
Magnolia	4	C SW NW NE 19-1-3W	2703–3147	30M
Magnolia	2	NEc SW 34-1-3W	3088–3125	125
Magnolia	11	NWc SW 24-2-3W	2178–2658	75
Magnolia	4	NWc NE 26-2-3W	2955–2980	10
Coline	7	NWc SE 7-2-2W	2250–2265	40
Amerada	14	NEc SW 28-5-1E	1250–1263	50
Amerada	12	SWc SE NE NW 28-5-1E	1153–1160	40

Comanche County

Company	Well No.	Location	Depth	Initial Production
Texhoma	1	SWc NE SE 20-2-9W	T.D.2266	Dry

Creek County

Company	Well No.	Location	Depth	Initial Production
Gled	5	SEc NE NE SE 14-19-8	1678–1697	5
Gypsy	4	NEc SW SE 2-14-8	2499–2531	45
Shaffer	3	NEc NW NE 17-17-11	2460–2487	200
Crosby	12	NEc SW 10-16-11	2330–2346	15
Wilcox	2	SEc NW SE 18-14-10	2876–2960	15
Mid-Cont. et al	3	NEc SW NW 32-14-10	3465–3475	205
Tibbens	2	NWc NE SE NW 14-14-8	T.D.3225	Dry
Papoose	1	C NW NE SE 28-14-8	T.D.3450	Dry
Berry	1-A	SWc NE NW 18-15-10	T.D.3465	Dry
Continental	2	NEc NW NE 34-15-10	3183	Dry
Cent. Natl	1	NEc NW NE 3-14-10	T.D.3206	Dry

Garfield County—Garber

Company	Well No.	Location	Depth	Initial Production
Mid-Cont-Marland	1	C SE SW SW 36-23-4W	1443–1449	30
Sinclair	34	C NW NE NW 19-22-3W	4308–4314	1130
Knox	3	SWc NW NW SW 31-22-3W	2210–2230	100
Mid-Kans	2	C NE SW NE 18-22-3W	T.D.2300	Dry

Grady County

Company	Well No.	Location	Depth	Initial Production
Skelly	1	C NW NE 11-4-8W	1401–1419	9M
Carter	1	C NW NE NE 16-4-6W	T.D.3515	Dry

Hughes County—Papoose

Company	Well No.	Location	Depth	Initial Production
Empire	1	C SE SW NW 26-9-9E	3450–3456	140
Empire	3	C SW SE NW 26-9-9E	3407–3419	248
Independent	1	C SW SW NE 26-9-9E	3388–3397	25
Transcont.-Indep	2	C NW NW SW 26-9-9E	3359–3381	905
Transcont.-Indep	5	C NE NE SW 26-9-9	3337–3349	535
Phillips	2	C SE NE SE 27-9-9	3389–3393	605
Indep	2	C NW SW NE 26-9-9	T.D.1905	Dry

Kay County—Braman

Company	Well No.	Location	Depth	Initial Production
Texas	1	SEc NE 20-29-1W	2083–2086	120
Comar	6	SWc NE SW 21-29-1	1909–2076	20
Comar	2	NEc NW 28-29-1	1935–2110	31

Kay County—Braman Townsite

Company	Well No.	Location	Depth	Initial Production
Wrightsman	1	Blk 18, Lot 10	T.D.50	Dry
Freidman	1	Blk 2, Lot 13	T.D. 620	Dry
Mummert et al	1	Blk 9, Blk 24	T.D.2478	Dry
Triangle	1	Blk 14, Lot 26	T.D.2515	Dry
Mid-Cont	1	Blk 1, Lot 21	T.D.2535	Dry
Wendell et al	1	Blk 3, Lot 4	T.D. 892	Dry
Cain et al	1	Blk 23, Lot 3	T.D. 900	Dry
Lassen et al	1	Blk 10, Lot 3	T.D.2312	Dry
L & M	1	Blk 24, Lot 24	T.D.2290	Dry
Broadhurst et al	1	Blk 3, Lot 12	T.D. 833	Dry
Windle et al	1	Blk 15, Lot 28	T.D.1105	Dry
Walls-Wade	1	Blk 21, Lot 7	T.D. 260	Dry
Fitzgerald	1	Blk 11, Lot 10	T.D. 475	Dry
Jackson et al	1	Blk 18, Lot 24	T.D. 502	Dry

Kay County—Hubbard

Company	Well No.	Location	Depth	Initial Production
Marland	4	SEc NE 1-26-2W	2955–2973	50
Comar	9	C NW SW NW 34-25-1	4228–4255	392

Lincoln County—Davenport

Company	Well No.	Location	Depth	Initial Production
Magnolia	3	C NE SE NE 4-14-5E	3442–3461	127
Gypsy	3	NWc NE NW 11-14-5	3301–3387	850

Lincoln County

Company	Well No.	Location	Depth	Initial Production
Pure	2	NWc SW 12-14-4	T.D.3787	Dry

Noble County—Tonkawa

Company	Well No.	Location	Depth	Initial Production
Comar	8	SWc NE 2-24-1W	4264–4282 OWD	35
Cosden-Marland	11	NEc SW NE SE 16-24-1	1993–2007	35

Noble County

Company	Well No.	Location	Depth	Initial Production
Wentz	1	C SW NE NW 27-22-1E	T.D.-4704	Dry
Magnolia	1	C SW SW SE 14-21-2	T.D.4527	Dry

Okfuskee County

Company	Well No.	Location	Depth	Initial Production
Bingham-Smith	1	NEc 21-13-8	2395–2420	45
Waite Phillips	1	SWc 1-12-7E	T.D.4478	Dry
Windsor-Indep	3	NEc SW SW 22-11-11	3973	Dry

Okmulgee County

Company	Well No.	Location	Depth	Initial Production
Hammond et al	5	SEc SW SW 26-15-12E	1828–1878	24M
Powell	9	SEc NE 8-14-15	1185–1215	20
Pulaski	8	NEc SW NW 1-11-13	2850–2854	110
Reno	1	NWc NE NW 29-16-12	2755	Dry
Andrews et al	4	NWc SW NW 32-14-14	T.D.2580	Dry

Osage County

Company	Well No.	Location	Depth	Initial Production
Tidal Osage	2	NWc SE SW SW 24-24-8E	2142–2205	10
Peters et al	13	NEc SW NE SW 33-23-12	1486–1496	15
Kanupp et al	1	NEc NW 33-22-12	1282–1308	5
Phillips	5	SEc NE SE SE 10-21-9	2220–2241	75
Moore et al	6	SEc SW SW SW 11-21-9	2263–2286	110
Swoverland et al	2	NEc NW SW 19-21-10	2145–2155	32M
Continental	13	SWc NE SW NW 28-20-12	1940–1943	75
P & R-Comar	2	SWc NW SW SW 8-27-6E	T.D.3658	Dry
P & R-Comar	3	SWc SE SW SW 8-27-6	T.D.2994	Dry
Devonian	4	SEc NE SE NE 10-21-10	T.D.2426	Dry

Pawnee County

Company	Well No.	Location	Depth	Initial Production
Billingslea	1	NWc NE 11-21-5	T.D.3510	Dry
Mid-Cont	7	SEc NW SW SW 36-21-7	T.D.2800	Dry
Magnolia	1	SEc NW SW 9-20-6	3058–3076	150

Payne County—Mehan

Company	Well No.	Location	Depth	Initial Production
Deep Rock	1	NEc SW 23-18-E	4213–4255	60 & 39M
Deep Rock	2	C NW NE NE 26-18-3	3740–3772	197
Mulberry	3	NWc NE NW 5-17-4	3270–3315	21M

Seminole County—Cromwell

Company	Well No.	Location	Depth	Initial Production
Carter-Pulaski	7	C SW NE NW 33-11-8	3394–3435	80
McMan et al	2	C NW SW SE 34-11-8	3344–3387	25
Indep. et al	1	C SE NE SE 7-9-8	3288–3313	100
Twin State	1	C SW SW SW 8-9-8	3265–3290	20
Shaffer	1	C NE NE NE 18-9-8	3270–3296	120

Seminole County

Company	Well No.	Location	Depth	Initial Production
P & R	1	SEc SW NE 25-8-7E	3049–3075	125
Transcont	1	NEc SW 22-7-7	2195–2215	15

Stephens County

Company	Well No.	Location	Depth	Initial Production
Douthitt et al	1	SEc NE NE 26-1-9W	2266–2276 OWD	45
Pace et al	1	NWc NE SW 23-2-9W	T.D.2512	Dry
Pace et al	1	SWc SE SE NE 11-2-8W	T.D.2300	Dry
Magnolia	6	NWc NE SE SW 17-2-7W	T.D.1823	Dry

Tulsa County

Company	Well No.	Location	Depth	Initial Production
Hawk et al	1	SEc NW SW 7-19-14	T.D.1319	Dry

KANSAS

Barton County

Company	Well No.	Location	Depth	Initial Production
Gray	1	NWc 31-18-12	T.D.2100	Dry

Butler County

Company	Well No.	Location	Depth	Initial Production
Skelly	1	NWc SE 32-23-8	T.D.2843	Dry
Liggett et al	1	SEc NE NE 16-26-7E	T.D.2825	Dry
Boyle et al	1	NWc SW SE 11-28-7E	T.D.3172	Dry
Empire	92	CNL NW SE NW 21-25-5E	648– 669	10
Phillips	1	NWc SE SW 27-26-7	2132–2143	6
Young Farm	4	SEc SW NW 27-26-7	2160–2171	20

Chase County

Company	Well No.	Location	Depth	Initial Production
Hammond et al	1	SEc SW 13-20-8E	T.D.2601	Dry
Selby	1	SEc NW SE 35-22-9	T.D.2760	Dry

Cowley County

Company	Well No.	Location	Depth	Initial Production
Benedum-Trees	4	NEc NW SE 10-31-3	3041–3056	75
Elwell et al	1	SEc 17-34-3	3363–3374	85
Slick	1	NEc SW 19-32-3E	3440	Dry
Lewis	1	NWc NE NW 30-32-5	T.D.3210	Dry
McKnab et al	1	SWc 7-34-8	T.D.3131	Dry

Ellis County

Company	Well No.	Location	Depth	Initial Production
Ellis City	1	SWc NE 14-13-18	T.D.3985	Dry

Greenwood County

Company	Well No.	Location	Depth	Initial Production
Syndicate	1	SEc NE NW 12-22-10	2046–2113	550
Sinclair	33	SWc SE NW 20-22-10	2252–2316	150
Titus et al	15	CSL S½ NW 29-22-10	2384–2424	300
Empire	9	SWc NE SE 11-22-10	1842–1891	200
Empire	5	SWc NW NW 14-22-10	1874–1929	50
York State	7	CSL NW 33-22-10	1910–1930	75
Hayes et al	10	SWc NW NE 25-23-8	2546–2562	100
Empire	31	NWc SE SE 16-23-9	2387–2475	150
Phillips	7	NWc SW 19-23-9	2575–2663	25
W. Eagle et al	5	NEc NW SE 19-23-9	2549–2560	150
Connell et al	1	SWc NW SE 14-23-9	2085–2102	20
Theta	10	SWc 3-23-13	1584–1634	20

Lyon County

Company	Well No.	Location	Depth	Initial Production
Ritchey-Moore	1	SWc SW 34-21-10	2161–2194	1200

Russell County

Company	Well No.	Location	Depth	Initial Production
Snowden et al	1	SWc SE SW 32-11-15W	2837–2839	250
Skelly	3	NEc SE NE 18-12-15	2957–2986	200

Sumner County

Company	Well No.	Location	Depth	Initial Production
Marland	1	SEc NE 24-33-2	T.D.3281	Dry

Trego County

Company	Well No.	Location	Depth	Initial Production
Keys	1	NWc SE 5-11-25	T.D.1365	Dry
Keys	2	SWc NE SW 5-11-25W	T.D.1542	Dry

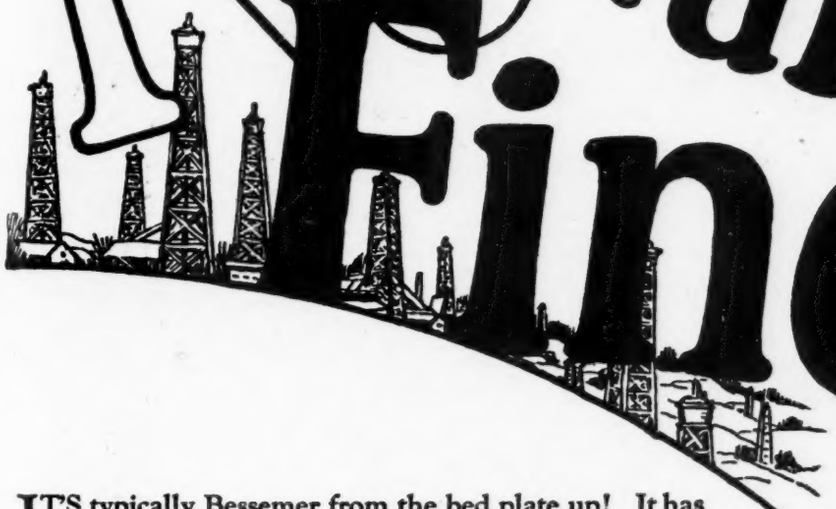
block. These operators are now drilling No. 2 a short distance east of No. 1.

Garber furnished a surprise during the past week when it brought back memories of its former greatness with two large wells, both of which made more than 5000 barrels in 24 hours while at their maximum output. Both wells are on the North Walker farm of the Sinclair Oil & Gas Co., and are on the northern edge of deep sand production in the field. The first one to come in, No. 24, in the NEc SE NE of 13-22-4W, made 5200 barrels in 24 hours, with no water. No. 28, a location to the west, or in the NWcSE NE of 13, topped the sand at 4255 feet and made 1515 barrels the first 12 hours. It was drilled to total depth of 4321 feet and found the big pay in the last two feet of sand, producing 5055 barrels in the ensuing 24 hours, with no water.

As a result of these two big wells, the Garber field showed an increase of about 7000 barrels in production during the week just ended, averaging 27,135 barrels from all sands, as compared with 21,930 barrels the preceding week. About 23,000 barrels of this amount comes from 51 deep wells, which are also making 8300 barrels of water daily.

An interesting test two and a half miles south of the south end of the Gar-

Newest and Finest Oil Field Engine



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These are a few of the many improvements and refinements.

First; It's entirely enclosed.

Second; Lubrication is combination force feed and splash, with splash for main bearings, connecting rod and crosshead.

Third; The air valve is placed on the *top* of the bed plate instead of underneath the cylinder.

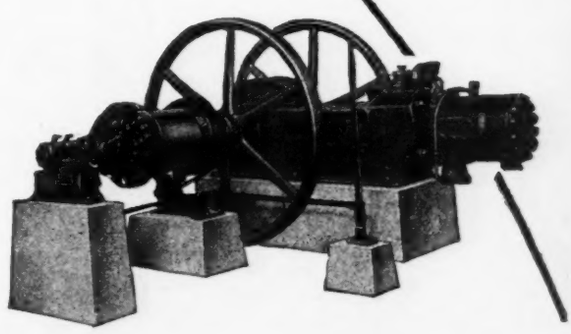
Fourth; The cylinder is bolted on the outside, permitting quick, easy removal of the cylinder.

Fifth; The crosshead guides are bored and the crosshead is fitted with cast iron shoes both top and bottom.

Sixth; The crankshaft bearings are of the box bearing type, easily removable.

Seventh; Larger water circulating capacity, and a 6″ exhaust, and in addition to these, there are many other improvements.

The new Bessemer Oil Field Engine is a real engineering achievement. It is sturdy, simple, economical, efficient—an engine which sets a new high standard.



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BESSEMER OIL FIELD ENGINES – COMPRESSORS VACUUM PUMPS – ROLLER PUMPING POWERS

Completions in North and Central Texas, Week Ended Feb. 13

Company	Well Farm	Location Survey	Depth	Initial Prod.
Archer County				
Riner-Bailey	32-Wilson	ATNC	1616–1619	40
Texhoma	10-Oldham	Hubble	1333–1353	20
Texhoma	2-Wolfe	Hutton	1324–1329	150
Darlick	7	TEL	1426–1432	65
Simms	3-Richardson	TEL	1448–1454	10
Texas	17-Hill	TEL	1381–1392	97
Consolidated	1-Kreeger	TEL	1418–1426	100
Roxana	1-Kreeger	TEL	1423–1426	65
Waite Phillips	1-Lowe	TEL	1200–1205	5
Texas	5-Boren	Newman	1063–1081	125
Staley-Wynne	1-Kemp	SP	T.D.1856	Dry
Perkins-Cummum	1-Mangold	Wright	T.D.1850	Dry
Young-Looney	1-Crawford	Crozine	T.D.1050	Dry
Consolidated	1-Feldhouse	Edwards	T.D.1650	Dry
Texhoma	9-Oldham	Hubble	T.D.1474	Dry
Logan et al	1-Logan	Taylor	T.D.1410	Dry
Phillips	3-Falls	Falls	T.D.1220	Dry
Sun	1-Falls	Falls	T.D.1301	Dry
Murchison-Fain	1-Neimeyer	TEL	T.D.1401	Dry
Atlantic	1-Andrews	Whittaker	1002 T.D.	Dry
Multiple	1-Hamilton	Crawford	1245 T.D.	Dry
Baylor County				
Waite Phillips	1-Schramm	TEL	T.D.1268	Dry
Texhoma	1-Mills	TEL	T.D.1422	Dry
Pandem	2-Portwood	Luggins	T.D.1450	Dry
Magnolia	3-Portwood	TEL	1424–1426	14
Brown County				
Huffman	1-Kilgore	McClure	1270–1290	15
Dozier-Mulloy	1-Byrd	Travis	1442–1448	15
Mulloy-Chandler	4-Stone	Miller	1288–1310	40
Gillman-McMurray	5-Chambers	Smith	1185–1198	50
Gillman-McMurray	6-Chambers	Smith	1174–1216	12
Phillips	2-Williams	Beck	1074–1098	6M
Hill-West	1-Newton	Mitchell	1193–1206	25
Cowboy Evans	2-Stone	Miller	T.D.1300	Dry
Cherokee County				
Collington et al	1-Clapp	Jowell	T.D.2788	Dry
Collington Drlg	2-Clapp		T.D.4276	Dry
Coleman County				
McNally-Wright	1-Sanders	GH&H	T.D.1100	Dry
Cranfill-Reynolds	1-Kingsberry	Wharton	T.D.1506	Dry
Culberson County				
Cal. Co.	1-Grisham	Public	T.D.4010	Dry
Ector County				
Farmers	1-Newham	TP	T.D.1420	Dry
Eastland County				
Clayton et al	1-Kimbrough	H&TC	3147–3174	6M
Glasscock County				
Gulf	5-McDaniel	TP	T.D.3902	Dry
Irion County				
Kirby	1-Bar S	H&TC	T.D.2700	Dry
Virginia-Tex	1-Case	SF	T.D.3062	Dry

Company	Well Farm	Location Survey	Depth	Initial Prod.
Jack County				
Buttram	1-Preston	Sleggle	2072–2074	100
Limestone County				
Magnolia	1-Williams	Varels	T.D.3015	Dry
Montague County				
Texas	1-Howland	Chambliss	1122–1125	50
Pure	2-Maddox	Arnold	935– 965	50
Navarro County				
King State	1-Laird	Dunnigan	T.D.3133	Dry
Sun	1-Swink	Hudson	2914–2970	1½M
Brothers	8-Bounds	Hillhouse	3192–3201	150
Palo Pinto County				
Phillips	1-Stringer	Poitevant	T.D.2004	Dry
Shackleford County				
Phillips	1-Fry	TEL	340– 345	15
Sterling County				
White Eagle	1-Mills	H&TC	T.D.3259	Dry
Stephens County				
Tex-Pac	4-Hand	TNO	3729–3736	20
Hickok	1-Parks	TEL	3040–3158	15, 4M
Throckmorton County				
Pandem	2-Portwood	Loggins	1433	Dry
Pandem et al	1-Portwood	Garett	T.D.1512	Dry
Magnolia	1-Davis	TEL	T.D.3950	Dry
Wichita County				
Beaudin	1-Snow	H&TC	T.D.1784	Dry
McCracken et al	1-Waits	BBB&C	T.D.1417	Dry
Panhandle	1-Robert	H&GN	T.D.2004	Dry
Underwood	1-Fassett	Cherokee	T.D.1804	Dry
Texhoma	12-Waggoner	BS&F	1752–1758	46
Texhoma	13-Waggoner	BS&F	1356–1363	17
Texhoma	2-Waggoner	BS&F	1754–1758	12
Wilbarger County				
Humble	1-Waggoner	H&TC	2354–2356	70
Humble	4-Waggoner	H&TC	1889–1901	75
Humble	4-Waggoner	H&TC	1856–1873	130
Humble	3-Waggoner	H&TC	1879–1899	100
Landreth	4-Waggoner	H&TC	1846–1860	200
Landreth	4-Waggoner	H&TC	1912–1926	90
Roxana	2-Waggoner	H&TC	2430–2437	40
Roxana	3-Waggoner	H&TC	1899–1926	405
Landreth	1-Waggoner	H&TC	1901–1911	140
Sloan	1-Waggoner	H&TC	2390–2425	70
States	1-Waggoner	H&TC	T.D.2375	Dry
Young County				
Green et al	1-Wilburn	TEL	T.D.1430	Dry
Jensen et al	1-Hart	TEL	T.D.1100	Dry
Murchison-Fain	1-Campbell	TEL	T.D.1050	Dry
Christie et al	1-Leberman	TEL	T.D.1000	Dry
Vance	1-Davis	TEL	T.D.3140	Dry
Bridwell et al	1-Street	TEL	1276–1286	25
Tex-Pac	2-Kunkle	TEL	1192–1196	10

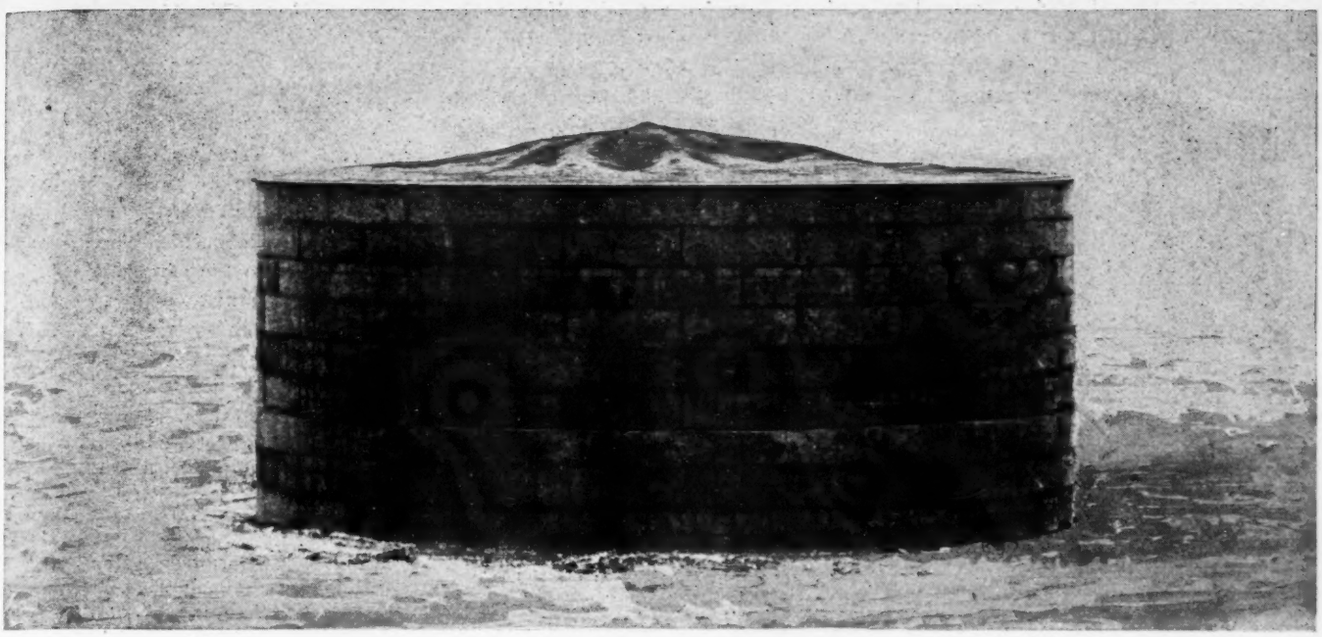
Completions in North Louisiana and Arkansas, Week Ended Feb. 11

Company	Well	Location	Depth	Yield
LOUISIANA				
LaSalle Parish—Urania				
Alexandria Oil Co	Urania No. 2	19–10–2E	1590	25
Dowling & McCurry	Holloway No. 1	34– 1–1E	1601	s.w. aband.
Nat. Gas & Fuel Corp	Tullos No. 4	25–10–1E	1527	60
Bossier Parish—Spring Hill				
J. F. Giles, trustee	N. A. Webb No. 1	20–23–11	3095	s.w. aband.
Caddo Parish—Vivian				
Austin Oil Co	Hoss No. 27	24–22–15	1052	
Dixie Oil Co. (Standard of Ind.)	Donovan No. 2	21–22–15	1058	52 50
Claiborne Parish				
Standard Oil Co. of La	Lowenberg No. 34	24–21– 8	1354	30
Evans & McMurphy	Boatner No. 1	10–19– 5	2910	s.w. aband.
Webster Parish—Minden				
Victor Wenzel	Lunsford No. 1	10–19– 9	2602	dry aband.
Bossier Parish—Bellevue				
La. Oil Refining Corp	Fee D-28	15–19–11	460	10
Ouachita Parish				
Southern Carbon Co	Fee No. 47	35–19–4E	2120	3m. ft. gas
Caldwell Parish				
Potts & Crickett, trustees	Gore No. 1	30–12–3E	2132	dry aband.
East Texas—Harrison County (Wakom)				
John Woodley et al	Abney No. 2	Jas. Bryant HRS	1975	50m. gas

Company	Well	Location	Depth	Yield
Shelby County				
James D. Collett	Crawford No.1	W.H.Hill HRS	4003	s.w. aband.
We Win Oil Co	Ashbury No.3	G.W.Mitchell HRS	2413	s.w. aband.
ARKANSAS				
LaFayette County				
Ark. Fuel Oil Corp	RedRiverLbr.Co.No.1	18–19–24	2791	15
Nevada County				
Steele et al	J. R. Ellis No. 1	2–14–21	1145	110
Smackover				
Gulf Refining Co	L. Werner S. M. Co. No. 45	6–16–16	2260	40
Humble O. & R. Co	Arnold B-9	26–15–16	2020	35
Woodley Pet. Co	Richardson No. 4	29–15–15	2075	100
Anderson et al	Murphy No. 2	15–16–15	2765	s.w. aband.
Federal Pet. Co	Ballard No. 6	10–16–15	2575	75
Harrell, trustee	Carroll No. 1	7–16–16	2321	50
E. M. Jones	Murphy No. 7	17–16–15	2530	140
Lion O. & Ref. Co	Lawton B-3	10–16–15	2620	40 10m. ft.gas
Lion O. & Ref. Co	Murphy G-6	8–16–15	2665	40m. ft.gas
Little Fay Oil Co	Harrell No. 5	17–16–15	2715	35m. ft. gas
Magnolia Pet. Co	J. Goodwin No. 9	5–16–15	2555	150
Magnolia Pet. Co	J. Goodwin No. 10	5–16–15	2529	25m. ft. gas
Nat. Gas & Fuel Co	Flenniken No. 4	8–16–15	2750	50m. ft.gas
Rovinger Oil Co	Dumas No. 2	9–17–16	2090	200
Simms Oil Co	Cook No. 5	16–16–15	2445	90
Thurman et al	Wilson No. 4	6–16–15	2565	40
LaFayette County—Stamps				
Beasley, trustee	Roper No. 1	27–16–23	2514	dry aband.

ber field is that of the Pender Petroleum Co., in the NWc SW SW of 4-21-3W, known as No. 1 Clark. This well had one million cubic feet of gas and made three 20-minute flows of 38-gravity crude in a 48-hour period after getting a sand at 2267 feet. The well had 400 feet of open hole and about 60 feet of cavings in the bottom when the sand was found, and it was decided to run a string of 5-3/16-inch pipe to top of sand and drill in. While this was being done the engine was damaged, and the well has been shut down since until the engine has been repaired. The well is cut off by several deep dry holes from the Garber field, but may mean the discovery of an important new field if completed for a commercial producer.

In the deep sand area of the Wewoka field, W. R. Ramsey drilled in his No. 4 Amos during the week and got initial production of better than 60 barrels an hour. This well, a northwest diagonal offset to the Magnolia Petroleum Co. deep-sand discovery well, is located in the SEc of 31-8-8, was drilled 10 feet



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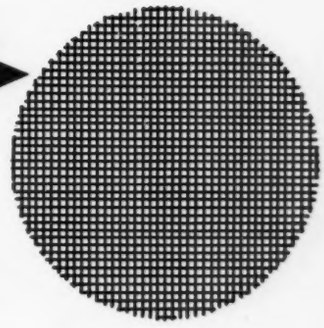

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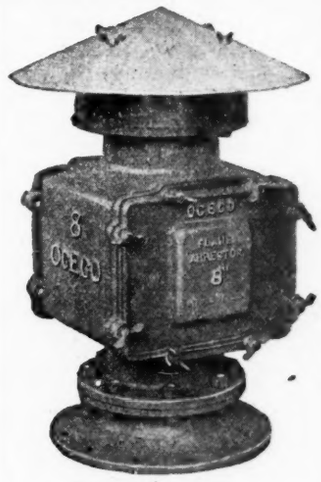

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into the sand topped at 4148 feet. Its production during the past 24 hours was 1418 barrels of 39.8 gravity crude. The temperature of the crude is reported as 72 degrees, which compares with about 115 degrees in the Magnolia discovery well.

One mile north and the same distance of the town of Wewoka, the Magnolia Petroleum Co. got lucky for the second time and drilled in a good well in its No. 2 Carolina, in the SWc SW NW of 14-8-7, in a small pool where only average-sized wells have been found so far. The Magnolia well made 887 barrels the past 24 hours in sand from 3178 to 3181 feet. This is the Gilcrease sand, which is productive in other fields in Seminole county. By way of comparison, the south offset to the Magnolia well, drilled by T. B. Slick, came in making 150 barrels and is now down to 100 barrels, while the southwest offset, a Magnolia well, is making only 40 barrels.

Davenport Completions

In the Davenport field, Lincoln county, the Southwestern Petroleum Co. drilled in its No. 1 Roberson, in the NWc NE of 11-14-5, and it was flowing 35 barrels of 48-gravity crude an hour. It got the sand at 3365 feet and has been drilled to 3411 feet. Mid-Continent Petroleum Corp., which is offering a premium for crude of this character, is reported to be running this oil. In this field, Phillips Petroleum Co. No. 2 Patterson, in the NWc SE NW of 10-14-5, a quarter-mile east of the town of Davenport, got the sand from 3363 to 3402 feet, and made 160 barrels the first 18 hours. It will be shot in an effort to increase its production.

The Texas Co. No. 4 Hopkins "B," in the NWc SW SW of 2-14-5, started off at the rate of 57½ barrels an hour after a shot of 80 quarts in sand from 3309 to 3385 feet. Magnolia-Petroleum Co. No. 1 School Land, in the NEc NW of 16-14-5, two miles or more southwest of production in Davenport, has been drilled to 3660 feet with no showings of either oil, gas, or water. In the Skellyville pool, north and west of Stroud and in Lincoln county, Mid-Continent Petroleum Corp. has a good well in its No. 2 Earp, in the NWc of 8-15-6. This well got the sand at 4028 feet and has been drilled to 4035 feet, flowing 1123 barrels the first 24 hours. It was deepened three feet from 4032 feet the day after it came in, with no increase in production.

In the Fuhrman pool, south of Papoose, Gypsy Oil Co. No. I Long, in the NEc SE SE of 27-9-9, was deepened one foot from 3367 to 3368 feet, and went out of sand into shale, with no increase in production. It made 625 barrels in the last 24 hours. Transcontinental-Independent Oil & Gas Co. No. 6 Harjo, in the SWc NW SW of 26-9-9, was shot with 40 quarts during the week, but did not increase its production, which is only 120 barrels daily.

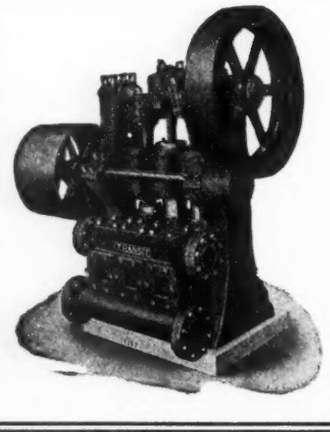
Wells Completed

In Oklahoma, during the week just closed, 96 wells were completed, of which 51 were oil wells, five were gas wells, and 40 were dry holes. This compares with last week's report of 65 completions, divided 39 oil wells, seven gas wells, and 19 dry holes.

The 51 oil wells included in this week's report had a total initial production of 7705 barrels, giving them an average of 151.1 barrels per well. Last week, 39 wells brought in 9619 barrels of new production, with a per-well average of 249.2 barrels.

Completions reported from Kansas this week totaled 35, of which 22 were oil wells and 13 were dry holes. Last week, there were 23 Kansas completions, divided 13 oil wells and 10 dry holes. The 22 oil wells in this week's report totaled 3796 barrels intitial production, with a per-well average of 172.6 barrels. Last week, 13 wells accounted for 1415 barrels of new production, averaging 108.8 barrels per well.

COLUMBUS, O.—The Pure Oil Co. has just opened a bulk distributing station at Richmond, Ind. This station completes the company's service along the national highway from Indianapolis to Pittsburgh.



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Pine Challenges Couzens

(Continued from page 57)

ruling of the Treasury Department and the claims made by the oil companies which have resulted in this gross favoritism, this indefensible discrimination, and this loss to the Government of revenues which amounts, in my opinion, to hundreds of millions of dollars. The amendment before us will, in my opinion, prove more favorable to the oil industry than the present law. No wonder the oil interests are back of this amendment and determined that it shall be enacted into law.

"Notwithstanding the present statute allows them enormous deductions and advantages and absolves them from paying a just tax to the Government, the tendered amendment will further protect them and so operate as to absolve many producers from paying any tax whatever. The passage of this amendment will be received with great joy by the oil companies of the United States.

"I can not understand this great solicitude for the Standard Oil Co., the Shell Co., the Sinclair Co., and the other great organizations, whose annual profits are many hundreds of millions of dollars.

"Mr. President, under the guise of simplifying the law we are asked to further legislate in the interest of those who have made millions in the oil fields of the United States. Every industry and every taxpayer should be treated fairly; there should be no iniquities and no favoritism. I am afraid we are blinded because of the power and the bigness of great corporations and sometimes deal unjustly with the people. Those who invest capital in acquiring oil lands and in drilling wells should have proper deductions and should have a return on their capital before they are called upon to pay taxes to the Federal Government. They are entitled to the application of the same principles which govern in determining invested capital, losses, depreciation, and so forth, in other lines of industry. It may be that because of the peculiar hazards in drilling wells there should be an additional allowance or deduction. But the proposition before us goes far beyond any reasonable or fair limits, and is a concession to a profitable industry denied to other industries and not warranted by any conditions of which we have knowledge growing out of or connected with oil production."

COLUMBUS, O.—The new gas booster station of the Pure Oil Co. at Dawes, W. Va., is now handling about 8,000,000 feet of gas daily. The gasoline is first extracted from the gas, after which it is delivered to the company's Cabin Creek refinery and the Hope Natural Gas Co.

Start Another Survey in Arctic Reserve

WASHINGTON, Feb. 13.—Another geologic and topographic survey of the navy's petroleum reserve, No. 4, in Alaska, beyond the Arctic Circle, the fourth since its creation, intended to cover an area of about 7000 square miles, has been begun, in the sense that Gerald Fitzgerald, topographic engineer, and W. R. Smith, geologist in the Geological Survey, are on their way north.

Mr. Fitzgerald was there last winter and Mr. Smith the winter before, that being his third trip to that part of Alaska for professional work. Their trip will practically complete the surveys for rock formation data and topography, from which conclusions can be drawn as to whether the reserve, almost as large as the state of Ohio, is worthy of the name of a petroleum reserve.

National Petroleum News has had reports of the two surveys but they consist of mere recitals as to the methods used in gathering data. There has been nothing revealed as to the significance, if any, of the rock data, in regard to the primary question, "Is there any oil, in commercial quantities in that reserve?" Mr. Smith has been at work on the geologic notes he brought back with him in the summer of 1924 after the winter trip to the far north, but the Geological Survey has not made public anything on the subject. It probably will not have anything to say unless it comes to the conclusion there is no oil in the survey, in a commercial sense.

The land belongs to the navy and whatever the geologists and topographers find is in the nature of a military secret, not to be divulged unless there is reason for so doing, chief of which would be a conclusion that there was no oil there. Should there be positive indications of a real pool, the navy would probably keep the fact to itself.

Robbery and Advertisement Help Increase Sales

HUDSON FALLS, N. Y., Feb. 13.—A robbery which resulted not only in the usual loss of merchandise, but in the addition of new customers and increased business was the experience of the R. S. Stone Oil Co., Inc., Independent jobber of lubricating oils and greases of this city.

Thieves who entered the company's bulk station one night took away two five gallon cans of Zero motor oil. When the loss was discovered, an advertisement, addressed to the robbers, was inserted into a local newspaper. During the days when this advertisement appeared, the company's telephones were busy. Some people called up to "josh" while others gave orders from one to 30 gallons. Hence, the loss from the robbery was offset many times by the new business the advertisement brought the company, according to R. S. Stone. Here is a copy of the advertisement:

To the Person Who Stole the Two 5-Gallon Cans of Zero Motor Oil

from our plant sometime Saturday or Sunday night.

Sir:—

The oil you stole from us is a medium Zero Cold Test Motor Oil suitable for use in a Buick, Overland, Maxwell, Chevrolet, Studebaker, Dodge and other cars requiring a medium bodied oil during winter months.

You will find this oil of excellent quality, having high flash and fire; viscosity of 310 to 320 at 100-F; No. 3 color; .03 to .04% carbon and of Zero Cold Test.

This medium grade is a little heavy for Ford cars. If you have stolen the wrong oil we suggest that you come down and buy a can of the Zero Light. You can save the medium until you steal a car using that grade. Whatever the situation we trust the oil gives satisfaction and service.

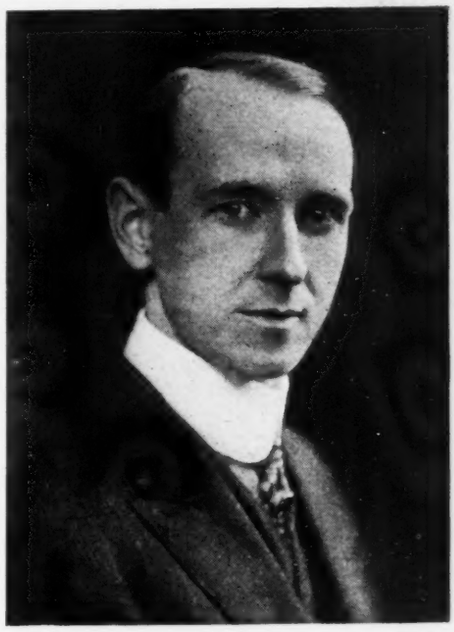
Very truly

R. S. STONE OIL CO.

R. S. STONE

PARRY STREET HUDSON FALLS PHONE 45

O. D. Robinson Organizes Marketing Companies



O. D. Robinson

CLEVELAND, Feb. 13.—O. D. Robinson, formerly vice-president of the Transcontinental Oil Co., is developing a wholesale oil business at Pittsburgh which he is allying with various oil marketing companies. He has organized the Republic Oil Co., with offices in the Union Bank Bldg., Pittsburgh, to do wholesale tank car business, and the Republic Oil Sales Co., to conduct a retail business in Pittsburgh. The latter company has purchased a half interest in the General Gas & Oil Co., at Wilkesbarre, Pa., doing a retail business there. In Pittsburgh the company has three service stations. Mr. Robinson plans to expand the business gradually.

Ohio Gets New Oil Jobber

WOOSTER, O.—The Wayne Petroleum Co. has been incorporated here for $50,000 to do a jobbing business in gasoline. The company is comprised of Ira L. Neely, general manager here for the Empire Gas & Fuel Co.., T. O. Bell, formerly in charge of distribution of Sinclair products in this territory, and Ceylon Hudson. The new company, of which Mr. Bell is manager, has purchased the bulk station of C. G. Stelzer located on the B. & O. tracks on the Lincoln highway intersection.

Three additional storage tanks have been installed at this station, giving a total of five tanks and storage capacity of 75,000 gallons for gasoline. Gasoline will be handled in wholesale quantities and arrangements have been made to furnish requirements to a number of filling stations in Wooster, and in Wayne county.

The company will handle Cities Service gasoline.

Chill Engine to Show Performance Of Oil In Ford Cars

ST. LOUIS, MO., Feb. 13.—Recently the R. J. Brown Petroleum Co. started using a method of their own invention for the cold testing of Brown's-Oyl (trade name) for Ford cars. The device was set up by Mr. Chappell, of the company, for testing, at sub-normal temperatures, under actual working conditions.

As shown in the photograph, a complete Ford engine is installed in an insulated case, ready to run. The oil to be tested is poured into the crankcase and the entire engine is packed with salt and ice and let stand for at least 12 hours. Through a tube extending from the outside into the crank case proper, a thermometer is inserted, giving the actual temperature of the oil in the crank case.

A high recording ammeter is connected with the starting motor to record the actual load in amperes required to start the engine with the oil chilled.

The method gives comprehensive information on the kind of oil required to start the engine easily at low temperatures and successfully lubricate it after it is started. The company has, with this device, chilled oil to five degrees below zero.

Case used to chill engine and oil in crankcase.

Illinois Jobber Acquires Oil Marketing Company

ROCKFORD, ILL.—Purchase of the Story Oil Co. of Freeport, Ill., one of the largest Independent oil marketers in Stephenson county, was made recently by the Osborne Oil Co., with headquarters at Rockford, according to C. W. Grout, sales manager of the latter company.

Purchase included the three drive-in service station and 15 curb pumps of the Story company. The Osborne operates eight service stations in Rockford and is also engages in jobbing and marketing fuel oil, lubricating and industrial oils, greases, kerosene and gasoline.

At the same time it announced acquisition of the Story company, the Osborne company purchased the property in East Freeport formerly occupied by the Waterloo Chemical Co. The building on the lot will be remodeled into a modern warehouse. The present building is three stories high, includes office building, garage and 150,000 gallons storage capacity.

Officers of the Osborne company are: W. J. Osborne, president; Erik Ekstrom, vice president; Charles Joyce, secretary; and Lloyd Scott, treasurer. Joseph Osborne, a brother of W. J. Osborne, is resident manager of the Freeport branch.

Harry Story, who was formerly proprietor of the Story company, has not announced his future plans.

Omaha Pays Delinquent Tax on Gasoline

LINCOLN, Feb. 13.—Dr. T. W. Bass, head of the Nebraska gasoline tax collection bureau, recently announced the arrival of a check from Omaha for $368.58 to pay the gasoline tax for that municipality. This has been due for quite a little time, it is understood. The tax accrued at the rate of 2 cents a gallon on gasoline bought and re-sold at Omaha's municipal station in 1923 when City Commissioner John Hopkins was making his race for re-election. Mr. Hopkins was commissioner of public safety, i. e., head of the fire department, and he installed a cut-rate "trust busting" gasoline pump in front of an Omaha fire station.

The result was a price war that is still going on in a more or less aggravated way. But when the price got so low that Mr. Hopkins could not afford to sell gasoline, even at city expense, he discontinued the fire station pump. Later the city became reluctant to pay the tax on the gasoline sold in those few days of active merchandising. City authorities claimed the enterprise was that of Hopkins individually although the gasoline had been ordered for the use of city trucks.

Ontario Oil Men Found Not Guilty of Unfair Prices

OTTAWA, ONT., Feb. 13.—The inquiry into gasoline prices in Ontario on which G. T. Clarkson made a report on behalf of the Ontario government, resulted in the exoneration of oil men from the charge of unfair prices. The gasoline and motor oil prices in Ontario between January 1924 and July 1925 were found fair and reasonable and were attributed to local conditions.

The report found that the public must rely on the honesty of the dealers from whom it purchases and no excess profits were being made in the sale of oils to the motorist, Mr. Clarkson stated.

Evidence furnished by refinery officers and wholesale dealers, to the effect that there is no agreement or understanding to stabilize gasoline prices in the province, was accepted as the true condition by Mr. Clarkson in his report. He also found that Canadian refiners, although in a position to regulate prices, have not taken advantage of this position.

Dispatching System Controls Oil Flow Through Mountain Pipeline

By Paul Wagner
N. P. N. Staff Writer

LOS ANGELES, Feb. 13 COMPLETE control of the flow of oil through the Los Angeles-Midway Pipe Line Co.'s recently constructed system across the Tehatchapi mountains is maintained through the medium of three dispatchers working in 8-hour shifts after the manner employed in railroad transportation.

Hourly reports are received from pump stations located along the north 45 miles of the pipe line and the dispatcher on the shift designates the time to start or stop pumping at a given station. The speed at which pumps are to be operated is also designated by the dispatcher.

The dispatching system is made necessary because of the peculiarity of conditions affecting the construction and operation of the 137-mile welded pipe line, which extends from the San Joaquin Valley fields near Taft, across a mountain range, into the Los Angeles Basin, near Wilmington, where the Pan American Western Petroleum Corp. refinery is located.

Both Doheny Companies

Both companies mentioned belong to the Edward L. Doheny interests and the pipe line company, along with other properties, was taken over by the Pan American Western as a result of $15,000,000 of financing recently announced.

In the first 45 miles from Lake Buena Vista station, near Taft, the 10-inch tube climbs from an elevation of 345 feet above sea level to an elevation of 4304 feet at the summit. Then the oil is carried to the terminus near Wilmington by gravity, a distance of nearly 100 miles. A pump station at Newhall, which has never been operated, would be utilized in case pressure became excessive on the gravity end of the line.

Construction Engineering Feat

Construction of this system was an engineering feat watched with interest by pipe line engineers throughout the country, inasmuch as it is the first Diesel type installation on the Pacific Coast for oil transportation purposes. Its functioning qualities will be further watched when the time shall come that the pipe line operates on the low viscosity oils of the Valley fields as against the lighter crudes now being run.

The Los Angeles-Midway pipe line also has been of interest to the engineering fraternity as regards its operation and maintenance, it being the first welded pipe line of 10-inch dimension covering such a distance and traversing a mountainous route.

Friction is apt to result in the transportation of crude through a pipe line traversing mountainous country, especially where elevations reach the magnitude of those in the Tehatchapi region, should wet or cold weather prevail. The heavier grades of crude would also tend to build up friction, in a relative sense, should it become desirable to transport them instead of the lighter gravity material now run.

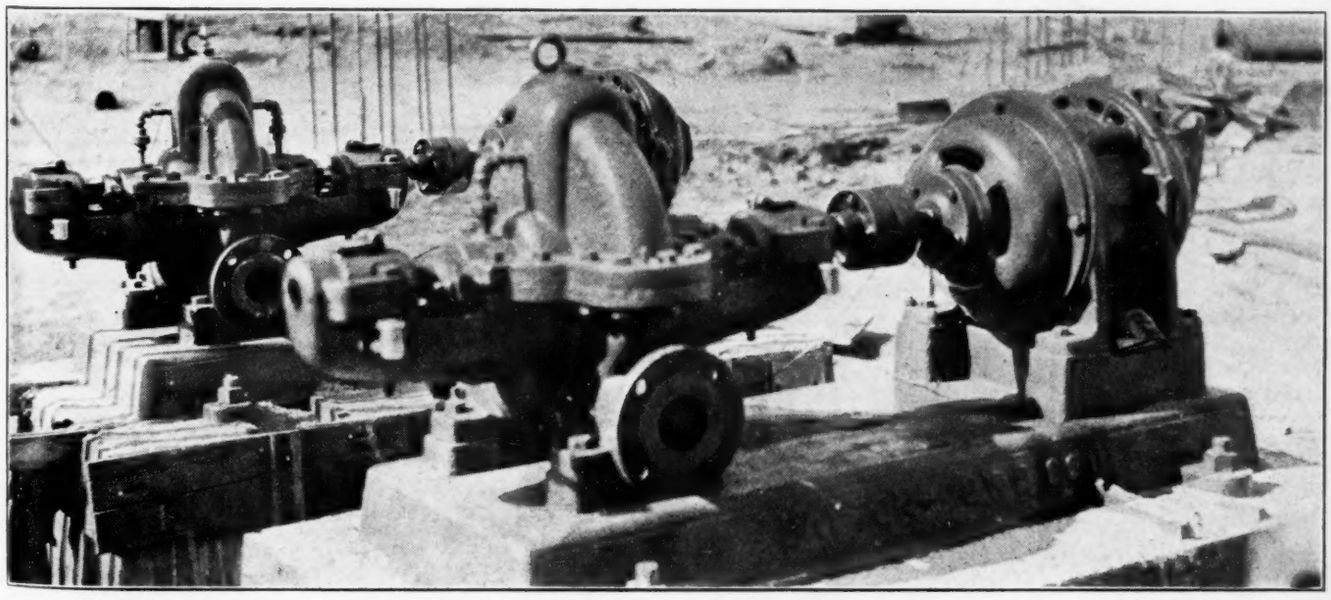
The four pump stations located on the north end of the line are necessarily close together, because of the rise in elevations to the point where the gravity end of the system begins to function.

In the first 19½ miles from Lake Buena Vista station south to Wheeler Ridge the rise in elevation is relatively gradual. The climb is from 345 feet above sea level to 830 feet. The next 11 miles takes the line to an elevation of 1800 feet. Then the real climb begins. The next station, 3½ miles away, is located at an elevation of 3070 feet, the pumps operating to lift the oil in the line to the summit at 4304 feet. The last mentioned stage also covers a distance of approximately 3½ miles from the pump station to the summit, where gravity begins to function.

On the down grade, the line first drops to an elevation of 2475 feet, rises again to 3600 feet, drops to 1100 feet, comes up to 1900 feet, goes down to approximately 700 feet, up to 1100 feet and then takes a gradual grade to about 70 feet of elevation at the Pan American's Watson plant, near Wilmington.

Running Half Capacity

Although the pipe line was built with the idea of its carrying 30,000 barrels of crude daily, it has been operating on less than 50 per cent of that quantity. This condition reflects in part the Elk Hills situation, the pipe line having been constructed with the idea of its providing an outlet for oil produced by the Doheny interests in the navy



Dayton-Dowd circulating pumps in position before pouring side walls of concret pump station on Los Angeles-Midway pipe line.

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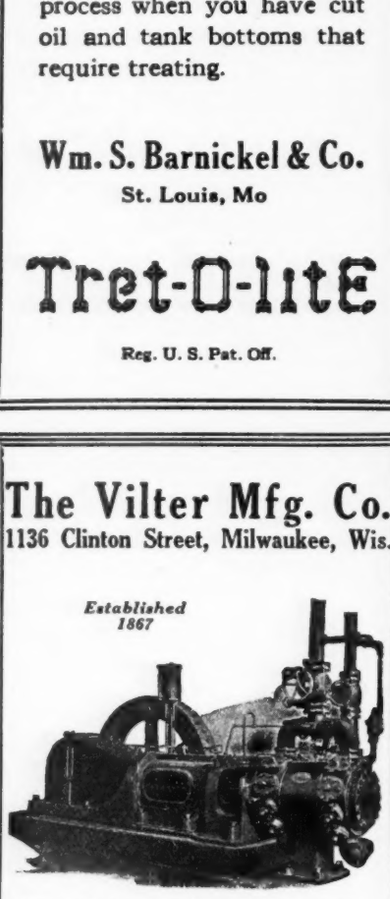

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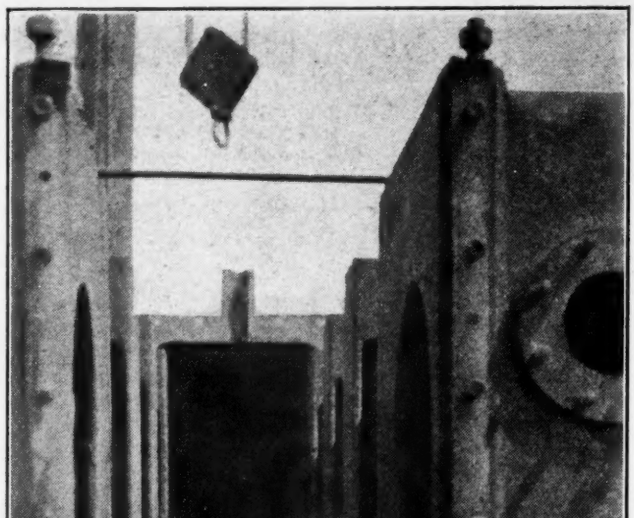

Crank-case on Worthington diesel-type engine used on Los Angeles-Midway pipe line.

reserve taken away from the Pan American in the lower courts.

Fuel Costs Low

When the line is functioning to its full capacity of 30,000 barrels daily it shows a relatively low fuel consumption of .41 pounds per horsepower hour. This compares with fuel consumption in lower altitudes, as in the Mid-Continent fields, in such manner as to show a decidedly economic installation. Fuel consumption in plants of other sections if the country runs as high as .46 pounds to .47 pounds per horsepower hour.

As an example of the recent operation of the pipe line it was pumping 575 barrels an hour at 620 pounds pressure.

The Los Angeles-Midway Pipe Line Co.'s system was built with the idea of its operating cost being cut to a minimum, hence the endeavor to take advantage of elevations in their effect upon the gravity end of the line.

It is also figured that the cost of the 10-inch line was less than the amount that would have been expended had the system been built of 8-inch pipe. This is explained by the statement that two more pumping stations would have been required for an 8-inch line than was the case with 10-inch construction. These would have cost about $550,000 additional.

Friction is higher on an 8-inch line, under conditions found in the mountains, as compared with 10-inch. Thus, the larger line works to the end of requiring fewer pump stations. The cost of 10-inch 40-pound pipe, over 8-inch, was said to have been only about 5 cents higher at the time of purchase.

The Los Angeles-Midway pipe line is the first to be equipped with oil burning Diesel type engines in California. Each pump station is equipped with two 300 horsepower, 17 x 25 vertical, full Diesel engines, two units to each of the stations.

These engines run the generators for making the current, which in turn run the motors that operate the pumps. The installation makes for economy of fuel and facility of operating the pumps in comparison with the steam power plants commonly used in California.

Each of the four stations on the system is equipped with the two following generator units:

Two 50 h.p. type Y, style VA, Fairbanks Morse full Diesel engines, connected to two 40 K.V.A., 257 r.p.m., 440 volt, 3-phase, 60-cycle alternators and two 3½ K. W., 257 r.p.m., 125 volt, D.

Iowa Jobber Puts Out House-Organ

MASON CITY, IA.—"Gas Gossip" is a new house-organ in the ranks of the oil industry and is published monthly by the Mason City Oil & Grease Co., with headquarters. C. J. Caward, secretary of the company, is editor.

It is a four-page leaflet and is being published to promote friendship and good will between customers and employes. It is devoted to short articles on timely subjects, to topics of interest in the industry, to company affairs and personals. Jokes are included under the head "The Exhaust Pipe."

The company markets Vapor gasoline and Premo auto oil, which it calls "The Power Twins."

C. flexible coupling exciters.

The aforementioned generator units are described as giving 80 per cent power efficiency, a maximum of 32 K.W. for each unit. Each unit is connected to Westinghouse Electric complete switchboard with generator ammeters, volt meters, exciter volt meter, synchroscope, generator switches, etc.

Electrically driven equipment is composed of the following:

One 1½" Fairbanks Morse circulating pump directly connected to one 3 h.p., 1760 r.p.m., 440 volt motor; two 2½" Dayton Dowd centrifugal pumps, capacity 180 gallons, directly connected to two 7½ h.p. General Electric motors 1750 r.p.m., 440 volts; one 2½" Dayton Dowd centrifugal jacket water pump, directly connected to one 5 h. p. General Electric motor, 1750 r.p.m., 440 volts; one 1½ x 10 Byron Jackson vertical sump pump, directly connected to one 2 h.p. General Electric 4 pole, 60 cycle, 440 volt induction motor; and one 3" x 3" single self contained unit 1-ton York ice machine.

Crossing a canyon with the pipe line suspended to avoid caving banks and areas of heavy wash. This is illustrative of natural obstacles which engineering skill had to overcome.

John Burnett, general pipe line superintendent of the Los Angeles-Midway company, had charge of the construction and Col. E. M. Wilcox functioned as chief engineer in the building of the system.

Synthetic Rubber From Petroleum

THAT millions of dollars worth of a certain class of hydrocarbons are destroyed annually that might go into a synthetic rubber was the statement of Earl P. Stevenson, research director, of the Arthur D. Little, Inc., organization of Cambridge, Mass. Mr. Stevenson made this remark in the course of an address before the American Association for the Advancement of Science, in Kansas City, Dec. 29.

". . . . we should be interested in the production of synthetic rubber as consumers of more than 600,000,000 pounds, or 70 per cent of the world's production, all imported and exacting a tribute close to a half billion dollars. Synthetic rubber is more than a dream, for it has been not only realized in the laboratory, but during the War was produced in large quantities in Germany.

"It can be made from a certain class of hydrocarbons, known as the diolefines, through a process called polymerization. Now these diolefines are not in the radium class for scarcity. In fact, they are produced in large quantities in every petroleum refinery in this country. They are present in crude cracked naphtha where they are unwelcome and a source of trouble to the refiner who must dispose of them, and his method is by destroying them. They are reported to form gums, and generally stick up the valves of your automobile.

"In order to remove these bodies, the petroleum industry annually suffers a loss close to 90,000,000 gallons of motor fuel valued at $9,000,000, and incidentally destroys diolefines equivalent to a substantial proportion of our national requirement for rubber."

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Several Wildcats Now Actively Testing Washington's Oil Possibilities

By Robinson Saint-Amour and Ronald C. White

The accompanying outline of the work now under way in Washington, with some notes on the wells previously drilled, was written by two students at the University of Washington. Their information was obtained in large part from the state geologist of Washington and engineer-members of the University faculty—Editor.

SEATTLE, WASH., Feb. 13 THAT geological conditions in Washington point to the existence of high grade petroleum in commercial quantities, members of the Seattle Engineers' Club were told recently by Marcel Daly, French vice-consul and veteran geologist.

"A study of the geology of the state shows that Washington possesses evidence of an abundance of oil-forming materials together with the necessary sandstones and shales. Every condition seems to be favorable to the existence of high-grade petroleum in commercial quantities and the men who are spending their own money pioneering in this virgin and promising field have our sympathies," he said.

The people of the United States are little aware of the $600,000 development project now going forward in Washington, for they are attracted by the hue and cry in other states against fake oil stock concerns. The companies that are drilling for oil in the state are not seeking advertising so consequently have kept it "under their hat," so to speak.

New York Oil Test

In King county, the New York Oil Co. of Washington, which is a subsidiary of the New York Oil Co. of Wyoming, has leased several thousand acres in the vicinity of Auburn for development. Seattle financial groups, interested in developing their state have taken a number of leases, for future prospecting.

The search for oil in Washington is generally speaking now being carried on by companies of conscientious and intelligent men, who have financial resources to carry it through to the finish whatever may happen. These men are convinced by the reports of geologists that this territory is worthy of a thorough scientific test.

At present drilling is being done on sites selected by prominent geologists. This is one of the many reasons the companies look for success or failure within the next three years. There is no talk of gushers or fabulous fortunes about to be grasped.

"Good sandstones or 'sands' in which oil and gas might occur," said Dean Landes, dean of the College of Science, University of Washington, "are present in Washington at depths ranging from a few hundred feet to 3000 and 4000 feet."

The territory wherein oil prospecting is being carried on includes the southwestern portion of Skagit county, all of Island county, all of Thurston county, Cowlitz county, all of Wahkiakum county, Pacific county, Grays Harbor county, Mason county south of Union City, Jefferson county, Clallam and Kitsap counties, besides much of Eastern Washington.

In southwestern Washington, especially south of the Chehalis River, surface indications show signs of oil possibilities. This territory has been thoroughly investigated and the geologican characteristics have been found to be the same as those of some other oil producing regions. The shales, fossils seepages and sands are the same. Since the forests have been considerably logged off it has been possible to study the geological conditions and geologists have come to the conclusion that the land was upheaved and the domes and anticlines where oil collects were formed. These have been traced and mapped.

Seepages on Coast

Several places in western Washington, especially along the Pacific shore lines, show oil seepages. The best of these are near the mouth of the Hoh River. A high-grade paraffine base oil, seeps out of the sand there, but as yet no successful well has been sunk. There are also oil seeps near Hoh Head in Clallam county. Farther down the coast as far as Grays Harbor, these seepages are in evidence. Frequently the indications carry a very strong odor like kerosene, which one gets there at any time, by digging into the rock. Other showings are found in quarries near Ilwaco and at South Bend, Pacific county, and near Chehalis in Lewis county.

In the localities around Snohomish City and west of the Pacific Highway, the rocks are pitched at rather gentle angles, the proportions of shale to sandstone is large and the structures are among the best that are to be found in the state.

There are five major projects under way including the previously mentioned test of the New York Oil Co., and one about to start in the state. The other four are: one near Snohomish City; one at Castle Rock, near Aberdeen; one at Forks; one at Rattlesnake Ridge, in Benton county. The one to be started will be located at Montesano, Grays Harbor county.

The Snohomish well is down more than 2500 feet, and it is planned to drill it to a depth of 4000 feet. The one at Castle Rock was started the first of October and is equipped to drill to a depth of 3500 feet. If they are both drilled to their maximum depth, it will represent an investment of between $80,000 and $100,000.

It has been estimated that $1,500,000 has been spent in the last twenty-four years in drilling wells. Two or three were stock selling ventures, but the remainder legitimate efforts to locate oil.

Gas in Benton County

Of the possibilities in Eastern Washington, the most interesting according to geologists are those at Rattlesnake Ridge, Benton county. The tests have been made there by the Walla Walla Oil, Gas & Pipe Line Co. The Rattlesnake Ridge wells, although located on a dome, have not been sunk deep enough to have a real test. So far the deepest well is 1400 feet. They are producing several million feet of petroleum gas from shale every twenty-four hours.

There has been an old theory that Washington was so broken up geologically that if there were any pools of petroleum, they would have leaked out by now. This has been disproved in the last few years by the examinations of both Washington geologists and those sent here by large oil companies. This theory was due, most likely, to the fact that surveys by geological parties were not possible on account of the heavily timbered areas, covered by underbrush. Also there is a large part of the state covered by a glacial fill, which has hidden the outcroppings that are important in geological survey.

Prior to the present operations there were 23 wells sunk in western Washington alone, without satisfastory results, the first two being near the Pacific Ocean in the year 1901. During the years 1914 and 1915, the most activity was shown, with the drilling of 10 new wells. From 1915 to 1925, operations have been confined to the areas of Grays Harbor, Clallam county and Benton county.

The people of Grays Harbor county still discuss the operations of the Standard Oil Co. at Moclips and Pacific Beach. Wells were drilled by the Standard in 1919-1920 to depths of 3860 feet. The company has never given out information on the tests. All of the equipment was removed.

The well near the Government Locks at Ballard, put down by a local com-

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pany was a failure, for the reason that it was not located on structure. After the collapse of the Ballard venture in 1921, no further tests for oil were made in that part of the state until the Sol Duc Oil Co. began operations in February of the past year in Snohomish county. Drilling was begun with two shifts, working night and day and by the first of October the drill was down more than 2200 feet, with average progress being 12 to 14 feet per day. The well is equipped for drilling to a depth of 4000 feet.

Two important drillings are those at Chico, seven miles from Bremerton and one near Forks, in Clallam county. The well at Chico is being financed by a small group of Seattle and Kitsap county people, headed by J. T. Cain of Seattle. The holdings of the Forks Drilling Co. have recently been taken over by W. C. Lehman of Los Angeles and W. E. Calkins of Bradford, Pa. The Chico project was begun in 1923 and the Forks well in 1924. They are both down about 2000 feet and have equipment to go to 3500 feet.

Rotary at Montesano

Drilling at Montesano was begun Feb. 15, 1925 with standard cable tools. An unexpected amount of gravel and boulders was encountered at 300 feet which last July caved in and collapsed the casing, stopping operations. The derrick has been moved south about 40 feet and a new hole will be started with a combination rotary and diamond drill outfit. The new well will start 2000 feet lower at the surface than the one at Castle Rock and consequently should be much nearer the supposedly oil-bearing Hoh formations.

The Castle Rock drilling began Sept. 30, on top of a dome structure comprising approximately 20,000 acres and said to be one of the largest in Washington. This work is being carried on by the Sunburst Oil & Gas Co. of Great Falls, Mont.

W. G. Lackey Made President of Dunn-Lewis Recovery Co.

TULSA, Feb. 13.—W. G. Lackey, president, and T. T. Lackey, vice president of the W. G. Lackey Co., Tulsa, have recently moved to Tulsa with offices in the Kennedy bldg.

The Messrs. Lackey have joined I. L. Dunn and J. O. Lewis in the organization of the Dunn-Lewis Oil Recovery Co., W. G. Lackey becoming president of that company and T. T. Lackey, treasurer. Mr. Dunn is chairman of the board and Mr. Lewis vice-president.

Mr. Dunn and Mr. Lewis are among the pioneers in the application of air to reviving old and depleted fields and are well-known engineers in this line. They have under their supervision and direction several plants which are now under construction. All of this business is being taken over by the new company.

The Disposal of Petroleum Foots Oil

By L. G. Marsh
Associate Chemical Engineer, Bureau of Mines
and
L. D. Wyant
Former Chemical Engineer, Bureau of Mines

THE processes involved in the manufacture of foots oil are complex but may be described briefly as follows:

Paraffin wax is removed from lubricating distillate by chilling and cold pressing, the products of this operation being "pressed distillate" and "slack wax." Pressed distillate (sometimes referred to as "wax-free oil") is used as a base material for the manufacture of lubricating oils. Slack wax is a mixture of waxes and oils, containing usually 40 to 60 per cent of commercial paraffin wax.

The process used in refining slack wax is called "sweating" and involves the following steps: The slack wax is melted and while liquid is run into the pans of the "sweating oven." Each pan contains a substantial screen raised slightly above the bottom and is filled with water deep enough to cover the screen. The melted slack wax thus floats above the screen until it has cooled to a solid cake.

Water Then Withdrawn

The water is then withdrawn from the pan and the cake rests on the screen itself. The wax cake is then very slowly heated, and as the temperature rises the oil gradually drains away. The first fractions draining from the cake are oil, containing only a small percentage of commercial paraffin wax. As the temperature of the wax cake is increased, however, more of the commercial wax is melted out, so that the percentage of wax in the oil increases. In commercial practice it is customary to divide the material sweated from the wax cakes into two fractions, "foot oil" and "intermediate wax." The foots oil fraction is usually about half the volume of the slack wax charge. It usually contains 55 to 85 per cent of oil, the rest being wax.

The second cut separated by sweating is called "intermediate wax," and is very similar in composition to the orginal slack wax charged to the sweating pans. It contains all the material drained from the sweating oven from the time the foots oil cut is finished until the wax remaining in the pans is sufficiently free of oil to be considered as "finished" paraffin wax.

Table 1 shows the relative characteristics of several samples of foots oil, intermediate wax, and finished wax.

In refinery practice intermediate wax is usually put back with the new slack wax coming into the sweating plant, and thus recycled through the sweating operations. In refineries where the volume of intermediate wax is large it is often processed through the sweating operations separately, as it yields a special wax with a melting point lower than that of the regular or first-run paraffin. It is very easy, therefore, to dispose of intermediate wax as it works in well with the regular routine of plant operations.

Disposal of Foots Oil

Methods of recycling foots oil, however, vary widely in different refineries. Until recently refiners usually mixed the foots oil with part of the wax distillate from the crude and then distilled the mixture without using steam.

Dry or Cracking Distillation

This dry distillation is referred to in refinery parlance as a "cracking" distillation, but this use of the term should not be confused with its use as applied to pressure distillation for producing gasoline from gas oil or heavier oils. The temperature is not so high and the distillate is very much like the material charged to the still, apparently being only slightly "cracked." This "cracking" of the less volatile part of the lubricating distillate seems to be essential in refinery practice today, although application of improved methods of distillation may make it unnecessary in the future. For some reason, not understood at present, a large part of the lubricating distillate made by steam distillation directly from wax-bearing crude oil is not in condition for chilling and pressing. "Cracking" changes the character of the unpressable distillate so that the wax can be removed by the usual methods.

Experimental Study

However, recycling foot oil through the stills not only is unnecessary, but it lowers the wax content of the stock. This is shown by the following series of tests.

Five typical samples of foots oil were obtained from five representative refineries. The wax and oil contents*, the melting point of the wax, and the viscosity (in Saybolt seconds at 100° F.) of the wax-free oil were determined on each sample as shown in Table 2.

A sample of each foots oil was then vacuum distilled (40 mm. pressure) in the U. S. Bureau of Mines standard Hempel equipment†. The distillation range was noted and cloud points determined on each 10 per cent cut. (See Table 3.) A second sample was distilled dry at atmospheric pressure in a 1000 cc. copper distillation flask equipped with a one-inch chain-filled Hempel column, 13 inches high. A third sample was distilled dry in the same copper flask. This distillation was run very slowly at atmospheric pressure so that as much cracking of the foots oil as possible would be obtained. The data collected from these runs are shown in Table 3.

Cracking in Dry Distillation

It will be noted that the recovery is less in the two dry distillations than in the vacuum distillation. This is probably due to the formation of fixed gases which were not condensed. The cloud points indicate that some cracking took place in the dry distillations.

After determining the cloud points, the first five cuts were mixed and tests were made on the combined 50 per cent

Table No. 1—Typical Wax Sweating Products.

Sample	Material	(1) Melting Point	Specific Gravity (Melted)	Per Cent Wax	Per Cent Oil	(1) Melting Point of Wax Content
1	Foots Oil	92.4		42.15	57.85	115.6
2	Foots oil	99.2		38.35	61.65	121.1
3	Foots oil	93.2	.821	32.54	67.46	122.8
1	Intermediate wax	114.7		45.0	55.0	119.4
2	Intermediate wax	119.5		62.01	37.99	122.1
3	Intermediate wax	116.6	.795	77.44	22.56	125.0
1	Finished wax	127.3		93.64	6.36	128.2
2	Finished wax	129.1		95.42	4.58	129.7
3	Finished wax	129.8	.785	92.64	7.36	131.9

(1) Melting points in all tables were determined by the A. S. T. M. Petrolatum Melting Point Method. Tentative method of test for melting point of petrolatum: Proceedings, Vol. 22, pt. 2, pp. 766-767.

Table No. 2—Analyses of Foots Oil.

Sample Number	Per cent Wax	Melting Point of Wax °F.	Per Cent Oil	Viscosity of Oil at 100° F.
4	16.14	117.0	83.86	66
5	15.53	113.5	84.47	55
6	24.48	117.7	75.52	59
7	30.18	120.8	69.82	66
8	26.27	117.0	73.73	63

fraction. The last five cuts were likewise mixed together and tested. The results are given in Table 4.

It is apparent that the viscosity of the oil in the material recovered from the vacuum distillation was almost the same as the viscosity of the oil in original "foots oil" (as shown in Table 2), the slight difference probably being due to the slight amount of heavy residue left in the distillation flask. However, the viscosity of the oils from the two dry distillations was materially lower than the viscosity of either of the original oils. Furthermore, dry distillation decreases the wax content, particularly in the second half of the distillate. In general, also, the slower the distillation the greater are the harmful effects.

Recommendations

In other words, redistillation of foots oil causes cracking, and cracking lowers the viscosity of the oil content and reduces the percentage of commercial wax in the foots oil. Dry distillation of foots oil is, therefore, not recommended. Redistillation with steam would probably not injure the product, but would not increase the wax yield.

The data shown in Table 4 suggest that half of the foots oil could be distilled off, and the residue without further distillation could be run as "slack wax" direct to the sweaters. Accordingly, Samples 5 and 6 were distilled, the distillation being stopped when 50 per cent of the samples had come over. The distillates and residues showed practically the same wax contents as in Table 4. The residues, however, from dry distillation of both slack waxes were dark in color and bad in odor, and the separated paraffin was also dark. The results of the vacuum distillations, however, indicate that distillation in a vacuum or with steam might be successful.

In Steam Distillation

If steam distillation were used to redistill foots oil, the last half of the distillate might be used as slack wax, either to be sweated separately or mixed with the new slack wax coming into the sweating plant. The first half of the distillate might be mixed directly with the pressable distillate and recycled through the pressing and sweating operations. The commercial practicability of this procedure has not, however, been demonstrated.

The best procedure would apparently be to return the foots oil to the presses by mixing it with new wax distillate. For efficient pressing, however, the concentration of wax in the mixture should not be too high. Therefore, only a small amount of the foots oil could be added. In plants where the double pressing method is used, this disadvantage might be overcome by carrying out the first pressing at a slightly increased temperature. If the single pressing method is employed it might be possible to include more gas oil in the wax distillate from the stills so that the wax content of the mixed pressing stock at the pressing temperature would be satisfactory.

The most efficient method for any plant would, of course, have to be worked out by experiment.

*Wyant, L. D., and Marsh, L. G. Paraffin wax—properties, methods of testing wax, and of analyzing oil-wax mixtures, Technical Paper 368, Bureau of Mines.

†Dean, E. W., Hill, H. H., Smith, N. A. C., and Jacobs, W. A. The analytical distillation of petroleum and its products, Bull. 207, Bureau of Mines.

Table No. 3—Distillation of Foots Oil.

Sample Number	Per cent Off	Vacuum Distillation Temp. °F.	Vacuum Distillation Cloud °F.	Slow Dry Distillation Temp. °F.	Slow Dry Distillation Cloud °F.	Very Slow Dry Distillation Temp. °F.	Very Slow Dry Distillation Cloud °F.
4	10	418	26	563	Below 20	565	Below 20
	20	452	58	617	50	600	55
	30	480	74	630	69	630	68
	40	494	82	644	76	654	70
	50	506	88	658	75	655	76
	60	526	92	684	85	680	80
	70	548	94	708	89	678	85
	80	572	95	722	92	690	91
	90	590	95	726	91	700	91
	Residue	6.2%	Dark	4.5%	96	4.3%	96
5	10	408	26	500	20	510	Below 20
	20	439	56	540	49	550	50
	30	458	70	600	68	608	62
	40	476	78	636	80	639	78
	50	492	85	664	85	665	79
	60	502	88	682	88	672	84
	70	530	91	688	89	680	82
	80	540	92	699	91	678	90
	90	569	94	664	92	672	90
	Residue	4.8%	Dark	3.8%	Dark	2.0%	Dark
6	10	418	39	560	Below 20	564	Below 20
	20	458	61	620	58	618	56
	30	474	75	640	75	634	75
	40	480	82	660	80	654	83
	50	490	87	668	88	670	89
	60	518	92	690	90	680	95
	70	536	97	698	95	690	86
	80	568	102	700	100	672	86
	90	600	106	710	103	680	90
	Residue	6.8%	Dark	5.9%	Dark	3.2%	88
7	10	440	57	608	62	600	57
	20	470	75	658	79	645	74
	30	488	85	674	86	672	80
	40	500	92	688	89	678	90
	50	512	96	698	94	687	89
	60	528	100	714	98	698	93
	70	536	103	722	100	697	98
	80	560	106	734	98	698	97
	90	580	110	740	100	710	98
	Residue	8.2%	Dark	7.2%	98	3.8%	Dark
8	10	438	39	590	38	600	32
	20	464	63	618	64	606	62
	30	480	77	636	76	635	70
	40	494	88	646	88	645	83
	50	510	91	664	91	652	90
	60	522	94	680	94	690	92
	70	536	98	700	96	680	95
	80	558	100	726	98	670	99
	90	576	104	746	98	702	90
	Residue	7.2%	Dark	5.2%	94	3.5%	Dark

Table No. 4—Analyses of Redistilled Foots Oils.

Sample Number	After Vacuum Distillation % Wax	Melting Point of Wax, °F.	% Oil	Viscosity of Oil at 100° F.	After Dry Distillation % Wax	M. P. °F. Wax	% Oil	Vis. Oil at 100° F	After Very Slow Dry Distillation % Wax	M. P. °F. Wax	% Oil	Vis. Oil at 100° F.
4—A	8.82	114.0	91.18		7.47	111.0	92.53		7.04	110.0	92.96	
B	24.15	119.5	75.85		23.55	121.0	76.45		19.21	122.0	80.79	
C	16.48	117.4	83.52	63	15.51	118.2	84.49	51	13.12	118.8	86.88	50
5—A	5.57	108.9	94.43		5.07	104.8	94.93		4.34	105.8	95.66	
B	23.63	116.7	76.37		20.62	117.8	79.38		22.89	116.5	77.11	
C	14.60	113.6	85.40	55	12.84	114.5	87.16	54	13.66	114.0	86.34	47
6—A	10.19	108.1	89.81		9.43	101.0	90.57		8.96	107.1	91.04	
B	36.48	120.2	63.52		35.20	119.2	64.80		25.62	119.8	74.38	
C	23.22	116.8	76.78	58	22.31	116.8	77.69	47	17.29	117.7	82.71	46
7—A	20.68	115.8	79.32		22.22	115.6	77.78		20.04	114.8	79.96	
B	39.44	124.6	60.56		36.67	123.8	63.33		30.52	121.4	69.48	
C	30.06	120.9	69.94	65	29.44	120.2	70.56	61	25.23	120.0	74.77	60
8—A	16.36	109.6	83.64		16.30	111.1	83.70		16.80	110.8	83.20	
B	35.32	121.0	64.68		33.42	120.6	66.58		20.42	121.0	79.58	
C	25.84	117.8	74.16	61	24.86	116.6	75.14	56	18.61	116.2	81.39	53

A—First half B—Second half C—Entire distillate

HAVOLINE FRANCHISE SUCCESS No. 6

Advertisement of Indian Refining Co., Inc.

Exceptional three-year success merely whetted appetite of hustling local

Exclusive sales rights idea appealed to Lehigh Valley Oil Co., of Allentown, Pa.—Has already gathered in tidy profits, with more to come

SOME people have the habit of resting in self-satisfied complacence on their own successes. Harry A. Fritsch doesn't do things that way. If he did, he probably wouldn't be president of the Lehigh Valley Oil Company today, for that organization, in its short and successful career, has never once stopped to look back on its record with the feeling of having done well enough.

If you should happen to drive up before one of Lehigh's neat, up-to-date service stations—and be treated to some of the snappy and efficient service they deal out there—you would see evidences of this "never-rest-on-your-laurels" policy. And if you were told that the same company operated nine other stations of its own and supplied considerably over 500 pumps dotting the highways through five counties in Eastern Pennsylvania, you'd say to yourself: "It must have taken years of such live-wire, aggressive management to work up this business!"

Yet, before August, 1922, there was no Lehigh Valley Oil Company. In only three and a half years it has risen from a small, unrecognized concern operating one service station in Allentown, Pa., to its present imposing size. It has attained this position, too, in the face of keen competition by two other strong independents operating in the same territory, and with a sales staff of no more than a couple of salesmen and one station manager.

No Let-up in Expansion

Each year has seen steady growth. In 1923 five new stations were added to the original one. In 1924 three more were erected and put into operation. Last year witnessed a tenth station put up. Lehigh service is now obtainable in Allentown, Bethlehem, Catasauqua and four other nearby cities. And all the time Fritsch has been piling up an increasing number of independent outlets for oil and gas. At present, three wholesale plants and five trucks keep themselves busy moving Lehigh's huge gallonage of gasoline and oils.

When last October hove into sight, Fritsch and his associates in the Lehigh Valley Oil Company found themselves sitting pretty with a prosperous business. They were handling a well-rounded-out line of both local and national brands. There was no need to take on anything new to keep sales up to their high pitch. Yet did that close their eyes to new ideas? Not a jot! When they discovered what they thought was a chance to make an already good business even better, they lost no time looking into it.

And this was the idea they picked up—an offer from the Indian Refining Company for the exclusive sales rights of Havoline Oil in their territory.

Harry A. Fritsch, President of the Lehigh Valley Oil Company

"Two advantages immediately looked us square in the face," says Fritsch, "and both carried a strong appeal. First, Havoline was offering us a high-quality oil of known reputation, an oil with a convincing power story to tell car owners. We had heard enough about the tests on the Wasson Motor Check to know there must be something in it. And second, Havoline was willing to protect us. None of this business of letting us work up good Havoline distribution, and then taking it away when they wanted to market direct! We would be given exclusive sales rights for a definite number of years."

It looked like too good a proposition to miss. On October twentieth, Lehigh Valley Oil signed the Havoline franchise, to become effective the first of November.

Started Big Drive

Then Fritsch started bucking the line for Havoline sales. How? First, by putting up flange signs and crank-case signs, and distributing booklets. Then, by instructing his salesmen and station manager to show that Havoline could, should, and would sell big! For instance, Station Manager Weiand made the rounds of Lehigh's own locations, and gave practical demonstrations.

"I'm going to stay here for one hour," Weiand would tell the operators at each station. "And I'll show you that practically every customer you get can be sold Havoline." He made good his word with an average of nine sales to every ten customers—and left each time with the parting shot: "If I can sell it, you can sell it!"

Another outlet for the good news about Havoline has been Lehigh's own monthly publication, "The Gas Tank." This attractively gotten-up sheet is mailed by the Lehigh Valley Oil Company to a wide list of car owners throughout its territory.

Gallonage Piles Up

Fortunately, Fritsch discovered that on the Havoline proposition his company was swimming with the current, not against it.

"We found no trouble," he declares, "in switching customers to the new oil."

Sales for the first quarter-year under the franchise—November first to February first—were 12,000 gallons. And, basing its figures on previous oil sales, its three-months' marketing of Havoline, and seasonal variations, the Lehigh Valley Oil Company expects by the end of the year to pass the 60,000 gallon mark.

"This figure," contends Fritsch, "is a conservative estimate. There is no reason why Havoline shouldn't go across even bigger—if we push it hard.

"And why shouldn't we? We have nothing to fear, with our long-term contract guaranteeing us the profits from whatever distribution we build up. We're tied up with Havoline, and Havoline's tied up with us. What's more, we're both satisfied!"

(Outside Indiana, Illinois, Ohio and parts of Michigan and Kentucky (except territories already allotted), the Havoline franchise and Havoline support are open to local oil operators on a basis exactly like Fritsch's. Other things being equal, inquiries are given preference according to time of receipt. Wire or write A. H. White, Indian Refining Co., Inc., Lawrenceville, Ill.)

HAVOLINE
- the power oil

We See By The Papers—

Conscious and unconscious humor concerning the oil industry from the press of the nation.

National Petroleum News

The Decline of Civilization

The order of final survival is set forth by the St. Matthews, S. C., Times:

The Triangle Automotive Co. is putting up a filling station at the corner of the public road at the Banks farm. In the meantime a squad of carpenters are at work, under Sam Owen, Jr., owner, remodeling the old Farmers Bank building for law offices and a filling station, while J. L. Riley is repairing one of the old Carroll block buildings, now owned by The Home Bank for a barber shop. One of the town's leading lawyers and philosophers sizes up the situation in thiswise: "The farmers and merchants will go down together. The lawyers, doctors and preachers will come next. Then the barber shops and lastly the filling stations."

How Do They Know the Right Place?

Hubbard, Tex., News, comments on the non-success of interviewing oil men:

More than a score of buyers are in the field every day taking up leases at $1.00 per acre, and among this number of buyers, all the larger companies are represented. Just what it means, no one can say, it is a part of the game to know nothing. When a representative of the big companies is interviewed, his only reply is: "I don't know any more about it than you do. I have been sent here to buy acreage, and if I can get it in the right place, I am buying it."

Advice on the State of the Industry

Augusta, Ky., Chronicle, found two oil men in town one day recently and got from them the news on petroleum:

Mr. Lonknecker said there were 69,000,000 barrels of oil produced in the United States last year, Ohio producing 16,000,000 barrels, practically all of which came from the Trenton formation, and he says the same formation is to be found in the scope of country designated above.

Mr. Brown states to the Chronicle that the big pipe lines do not want any more oil fields opened, basing his opinion on the fact that when oil was struck on the George Galbraith farm near Bridgeville, the well was plugged and work stopped.

It Sounds Bigger That Way

Uvalde, Tex., Leader quotes local citizen on the output of a well he visited:

W. O. Victor and wife returned this week after a visit to Williamson County, East Bernard and other points. While away, Mr. Victor said he made a trip out to the new oil well at Bowlin, near Wharton. It was coming in at 10,000 gallons a day. The well was 3000 feet deep and was drilled in the middle of a plowed field.

The Well Worn Path

Little journeys reported by the Decatur, Ill., Herald:

Burke Williams, formerly with the United Service station and who resigned some weeks ago to go to the Standard filling station across the street from the United, has resigned at the Standard and gone back with the United.

Not That Kind Of Pumps

Filling stations are not necessarily dance halls, is the sapient decision of the attorney general of Illinois. As reported in the Princeton, Ill., Tribune, the query from the state's attorney of LaSalle county and the attorney general's reply are:

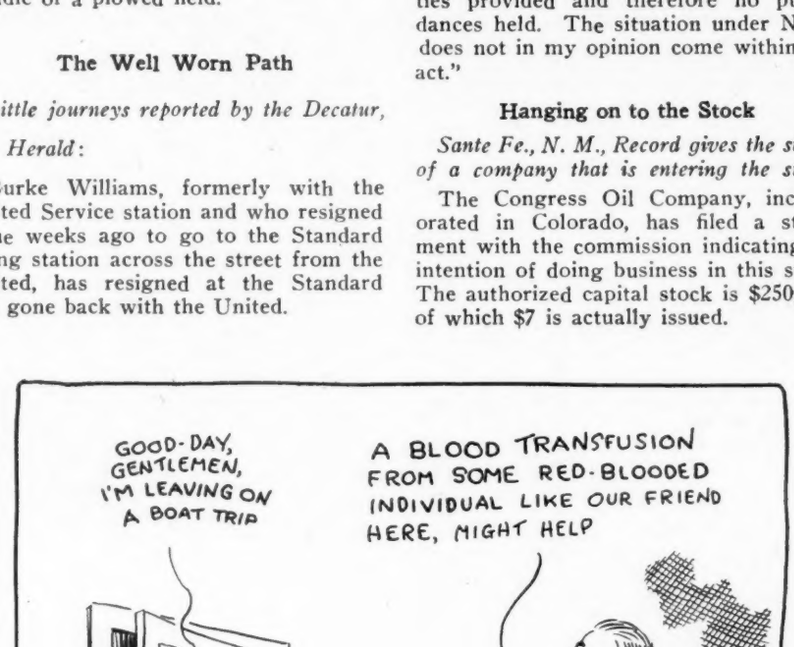
"2. A gasoline filling station along the hard road outside the limits of any municipality where lunches and soft drinks are served in connection with it, yet where no dancing facilities are provided. An automatic electric piano is maintained and operated there also."

Ans.—"As to the second statement of facts in your letter, it is my opinion that it is much the same as your first. No dancing is provided, no dancing facilities provided and therefore no public dances held. The situation under No. 2 does not in my opinion come within the act."

Hanging on to the Stock

Sante Fe., N. M., Record gives the status of a company that is entering the state:

The Congress Oil Company, incorporated in Colorado, has filed a statement with the commission indicating its intention of doing business in this state. The authorized capital stock is $250,000, of which $7 is actually issued.


GOOD-DAY, GENTLEMEN, I'M LEAVING ON A BOAT TRIP
A BLOOD TRANSFUSION FROM SOME RED-BLOODED INDIVIDUAL LIKE OUR FRIEND HERE, MIGHT HELP
OIL INDUSTRY
RAILROAD RATE COUNCIL
INTERSTATE COMMERCE COMMISSION
RATE INCREASE
THE RAILROADS
SEDGWICK

YES, WE MUST BE ON OUR WAY

The Editor's Viewpoint

National Petroleum News

Operating Skill, not "Bankers," Still Controls

THIS is the day of consolidation, is the statement one hears wherever two or more oil men are gathered these days. The talk generally goes on to lament the fate of the "small company" which may not be blessed by the hands of "the bankers." If the talk rambles on for as much as ten minutes even, one could easily become convinced that from now on no small oil company has the ghost of a show to exist, that they are nothing but detriments to the sweep of progress anyway.

All of which is very well, **B U T—**

Before the owners of the "small" companies lose heart and liquidate their holdings in oil, it might be well to get a few facts definitely in mind.

There are two types of consolidation, (1)—Those for purely sound operating reasons, and (2) those primarily for "banking" reasons and possibly some operating reasons.

We have these eras of consolidations periodically. Those of the past few months mark nothing new. Consolidations have been happening in oil for the past sixty-five years and in each consolidating era there was the same lament for the "small" company. After each of such eras we have had more and stronger "small" companies who, as a class, increased their percentage of business against the "big" companies.

While we grant the desirability for operating reasons alone of many consolidations, and admit there have been many such, isn't it also a fact that these consolidating eras happen to coincide with periods of public prosperity when "bankers" find it easy to sell stock? It really is more than a coincidence.

These consolidations by "bankers" have been more numerous since ten years ago when various oil men for various reasons went to New York and bought money for use in their business. That gave the "bankers" a taste of the profits of oil. In those days when there were profits they were good profits. Many a "banker" floated legitimate oil stock on the showings of a few profitable years and then, if he had been successful in disposing of the issues, stayed out during the unprofitable years.

Today we have a period of prosperity in the country. For many months now there have been good profits in many lines so "bankers" have been busy putting out stock and bond issues which the country has quickly absorbed. Also the oil industry, so far as many companies are concerned, has just had a fair year with prospects of a better one or two. Hence the time is right for an era of consolidations in oil.

No one can quarrel with those oil men who participate in consolidations, or who through such get out of the oil business. But we do enter protest against all this idle talk as if to consolidate was a holy thing, ordained by the Great Jehovah and which talk seeks to stampede everyone to either consolidate or drop out of his business through fear of the competition of these consolidated units. And which talk furthermore seeks to undermine the public's and the investor's confidence in the "smaller" companies that neglect (?) this glorious period of "consolidating."

Skill of management is what tells the story, rather than consolidating. That skill is much more likely to be with the oil man whether he is "consolidated" or not. And, as has frequently happened, when the oil man who was "consolidated" decided to leave he takes that necessary skill with him. That is one thing that "bankers" cannot consolidate.

Some of these ex-consolidated oil men have made bigger and better successes after getting out of "wonderful" consolidations than they or the "bankers" ever dreamed of before.

If you have real skill in management, let some one else worry about the consolidations. They may have to but you won't as long as you intelligently exercise that skill.

—W. C. P.

One Big Source of Oil Wastage

"THE public is always wasteful of the thing that is cheap," said Paul Shoup, president of the Southern Pacific Co., the oil company allied with the railroad of that name, at the Los Angeles A. P. I. meeting. "It is hard to get people to pick up pins even though all day they may have good luck. Economy and efficiency are apt to be promoted as the article grows more dear in price. If the public is wasteful it is because the oil industry is too efficient."

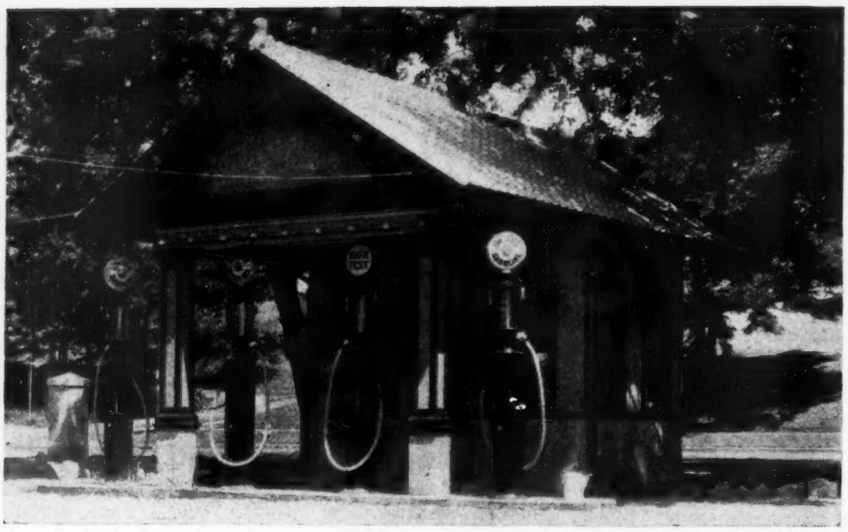
Herein is where the real conservation of petroleum resources lies. Competition and the necessity for making a profit to stay in business will constantly force the oil industry to more efficient methods but at present there is little thought being given by the public to conserving on its own account. The casual layman, if he thinks of it at all, thinks that the oil industry should do the conserving.

The oil industry does not want to take a position where it can be accused of "passing the buck" but the sooner it attacks openly and frankly the problem of making government officers and the public realize that the greatest opportunity for conservation can come only from the public, the better.

Let the oil industry gather some actual facts on the loss from dripping carburetors alone. That would be no criticism of the automobile manufacturers, for the average dripping carburetor can be blamed on one person only and that is the careless car owner who will not keep it in good shape. The evidence is sufficient against the carburetor. Look on the floor of any garage. Rare is the car that hasn't a bit of gasoline under it.

The water companies long ago found out what the big loss is from a dripping water faucet.

Certainly the oil industry can bring home to the car owner that gasoline is more valuable and not in such unlimited supply, as water.—W. C. P.



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Oil Patents Issued Recently

Production

Weight for Sinking Well Casings.—William H. Cater, Chicago. Filed Oct. 7, 1925. No. 1,569,000.

Pipe Wrench.—Donald M. Stainbrook, Orland, Ohio. Filed May 1, 1925. No. 1,569,148.

Well-Drilling Apparatus.—Charles H. Herman and Frank G. Schroer, Kansas City, Mo., Frank G. Schroer assignor to Charles H. Herman. Filed Jan. 7, 1924. No. 1,569,183.

Blow-Out Preventer.—James S. Abercrombie and Harry S. Cameron, Houston, Tex. Filed Apr. 14, 1922. No 1,569,247.

Adjustable Drilling Bit.—John Calahan, Lebanon, Ind. Filed Feb. 14, 1924. No. 1,569,262.

Disk Bit.—William S. Holdaway, Los Angeles. Filed Apr. 23, 1924. No 1,569,280.

Device for Introducing Cement in Wells.—Carlton E. Miller, San Francisco. Filed Jan. 23, 1923. No. 1,569,293.

Well-Drilling Derrick.—Samuel P. Powers, Wooster, Ohio. Filed May 9, 1922. No. 1,569,298.

Pump Jack.—Frank Gardner, Dallas. Filed Oct. 9, 1924. No. 1,569,318.

Puller for Pump Liners and Valve Seats.—William H. Clark, Whittier, Cal. Filed Aug. 27, 1924. No. 1,569,614.

Pipe Plug and Method of Removing the Same.—Thomas G. Massey, Montecito, Cal. Filed Mar. 28, 1922. No. 1,569,660.

Pump.—Chester C. Carter, Perryton, Tex. Filed Jan. 20, 1923. No. 1,569,714.

Tool for Straightening Well Casings.—Oswald Duda, Houston., assignor to Reed Roller Bit Co., Houston. Filed Dec. 27, 1923. No. 1,569,729.

Pump.—Charles R. Edwards, Houston. Filed Sept. 18, 1920. No. 1,569,731.

Fishing Tool for Wells.—Bert Lester Ligon, Electra, Tex., assignor to Ligon Tool Co., Electra, Tex. Filed Nov. 20, 1924. No. 1,569,818.

Refining

Heat Treatment of Hydrocarbons.—Harold R. Berry, Brooklyn, N. Y., assignor to the Dynamics Corp. of America, New York City. Filed Dec. 6, 1924. No. 1,569,532.

Natural Gas

Process of Obtaining Commercial Gasoline from Natural-Gas Gasoline.—Herman Jan Mackenzie and Alexander Wilhelmus Steenbergh, Tjepoe, Java, Dutch East Indies, assignors to De Bataafsche Petroleum Maatschappij, The Hague, Netherlands. Filed Sept. 26, 1923. No. 1,569,433.

Miscellaneous

Apparatus for and Process of Reclaiming and Converting Asphaltum and Other Materials from Waste Material.—Richard D. Divine, Chicago. Filed Jan. 18, 1924. No. 1,569,462.

Apparatus for Electrical Precipitation of Suspended Material from Gases.—George H. Horne, Glendale, Cal., assignor to International Precipitation Co., Los Angeles. Filed Apr. 13, 1925. No. 1,569,492.

Distributing Device for Moving Fluids and Gases.—George James Manson, Hawkesbury, Ontario, Canada. Filed Dec. 12, 1924. No. 1,569,558.

Apparatus for Electrical Precipitation of Suspended Material from Gases.—Charles H. Weiskopf, Hawthorne, Calif., assignor to International Precipitation Co., Los Angeles. Filed Apr. 13, 1925. No. 1,569,597.

Tank-Car Heater.—Horace W. Ash, Winchester, Mass. Filed June 15, 1923. No. 1,569,605.

Method of and Apparatus for Ascertaining the Proportion of a Constituent in a Fluid.—Edwin X. Schmidt and Ulric O. Hutton, Wilwaukee, assignors to The Cutler-Hammer Mfg. Co., Milwaukee. Filed Jan. 30, 1924. No. 1,569,682.

Apparatus for Demulsification of Oils, etc.—Charles V. Zoul, Santa Monica, Cal. assignor, by mesne assignments, to The Celite Co. Filed Jan. 30, 1923. No. 1,569,695.

Heat-Insulating Material and Process of Making Molded Bodies Thereof.—Webb T. Irvin, Lompoc, Calif., assignor to The Celite Co., Los Angeles. Filed Dec. 24, 1924. No. 1,569,755.

New Gasoline Testing Method Links Up With Operation of Engine

By W. S. James
Associated Oil Co., San Francisco

Delivered before A. P. I. Meeting, Los Angeles, Jan. 30

PRACTICALLY all the gasoline sold today is produced by "continuous" distillation. All gasoline used in carburetted internal combustion engines is vaporized in the manifold by "continuous" distillation. The measure of gasoline volatility, however, is based on a "batch" or discontinuous distillation.

The use of a test method differing fundamentally from conditions of production and of use has increased the difficulty of producing a gasoline suited to meet engine requirements, because the temperatures of test bear no rational relation to those of either production or of use.

In the refinery, the "end-point" is no longer approximately the vapor temperature for "cutting" the stream as "batch" distillation has passed out of use. In an engine manifold the "end-point" was never rationally related to the temperature required for vaporization, nor was the "initial boiling point" indicative of starting characteristics.

Why Not Continuous Test?

In view of these facts it seems natural to ask: Why not use a "continuous" method of distillation for measuring gasoline volatility? Would not the temperatures obtained from such a distillation be closely related to those of production and use? Is the use of a continuous laboratory method of distillation so difficult as to prove impractical for routine work?

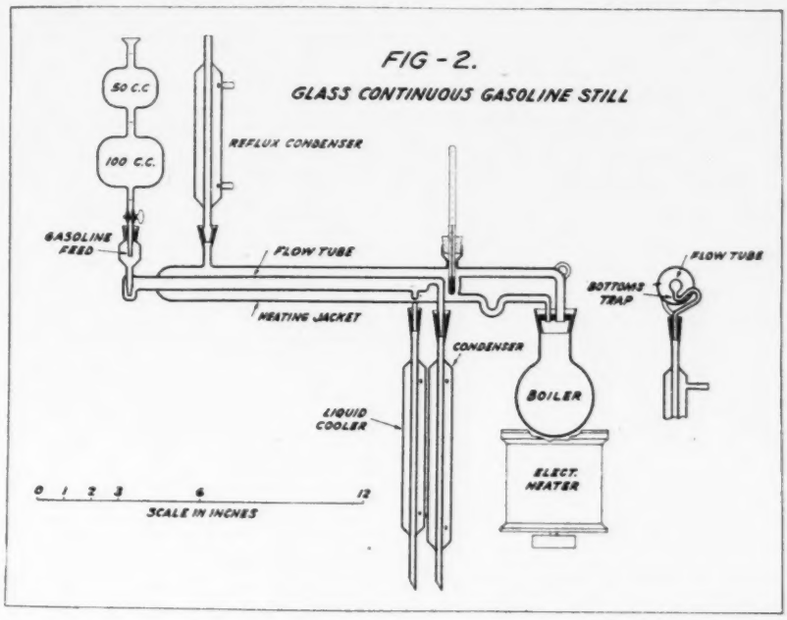


Figure 2.—Glass apparatus constructed on the same principle to allow clearer visualization of the process of distillation, flow tube of the appartus being heated by vapors from boiling liquid, such as water, benzol, amyl acetate, etc.

In an endeavor to obtain an answer to these questions the simple apparatus shown in Figure 1 was constructed. This apparatus consists of about 18 inches of half inch pipe welded into a piece of 3 inch pipe to serve as a steam racket. One end of the ½ inch pipe is brought directly through the "swaged down" end of the 3 inch pipe and the other end is fitted with a drilled block to serve as a liquid trap.

Just ahead of the liquid trap a vapor line is taken off the ½ inch pipe. The liquid trap and the entrance to the "vapor line" are enclosed within the steam jacket to maintain them at the same temperature as the ½ inch "flow tube." The gasoline is fed to the flow tube from a burette mounted above the water cooled trap.

The whole apparatus is mounted on a slight incline and the gasoline leaving the trap flows slowly down the flow tube. Before it reaches the trap at the other end it reaches the temperature of the bath and equilibrium is established between the composition of the vapor and the liquid. The vapor then passes out the vapor line to the condenser and the liquid flows through the trap to a liquid cooler. After sufficient gasoline has flowed through the apparatus to establish a steady regime, a measured volume is flowed through and the volumes of condensed vapor and liquid unvaporized are measured. The results given in this paper were obtained by measuring the volume of bottoms or unvaporized liquid flowing from either 100 or 50 cubic centimeters through the apparatus.

As considerable work was contemplated on crude as well as light products a second apparatus was construct-

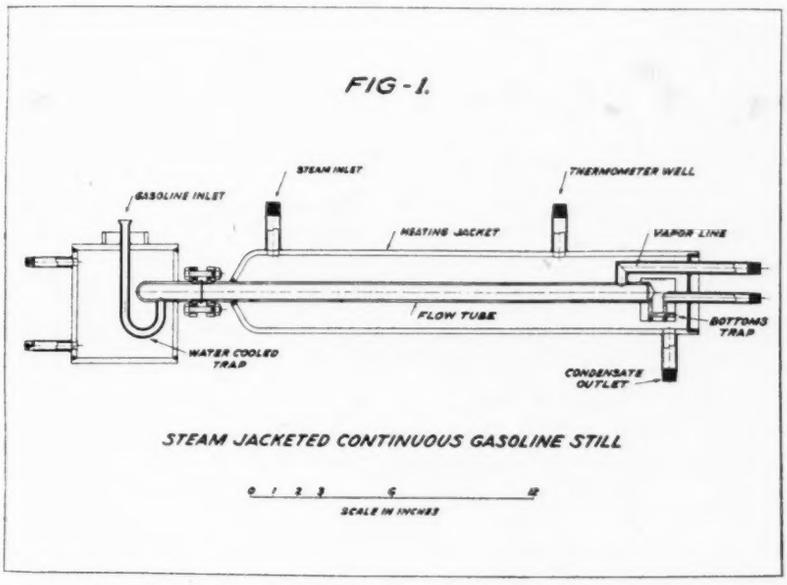


Figure 1.—Apparatus for a continuous method of distillation for measuring gasoline volatility in terms of unvaporized liquid remaining after state of equilibrium is established between the composition of the vapor and the liquid.

ed in which the flow tube was heated by oil circulated through the jacket. The unvaporized liquid trap at the end of the flow tube was made with a larger bore to accommodate the larger volumes of bottoms anticipated with crude. Temperatures up to 600° F. can be obtained in this apparatus.

In order to obtain a clearer visualization of the process of distillation and the action of the traps the small glass apparatus shown in Figure 2 was constructed. The flow tube of the glass apparatus was heated by vapors from a boiling liquid, such as water, benzol, amyl acetate, etc.

The results of the continuous distillation of four gasolines purchased on the open market are shown in Figure 3. For the purpose of comparison the usual distillations for these gasolines are shown in the same figure. The results of the continuous distillation show two marked differences from the usual "batch" method.

Temperature Range Reduced

The temperature range is greatly reduced and the per cent bottoms is much more nearly a linear relation to temperature. Practically nothing is distilled over below 160° F. and all the gasolines are completely vaporized at 320° F.

The results of the continuous distillation of a sample of domestic gasoline, a sample of absorption gasoline and a 50 per cent blend of each are shown in Figure 4. The same characteristics appear as in the distillation of the finished gasolines.

On this figure three of the difficulties encountered with the apparatus are

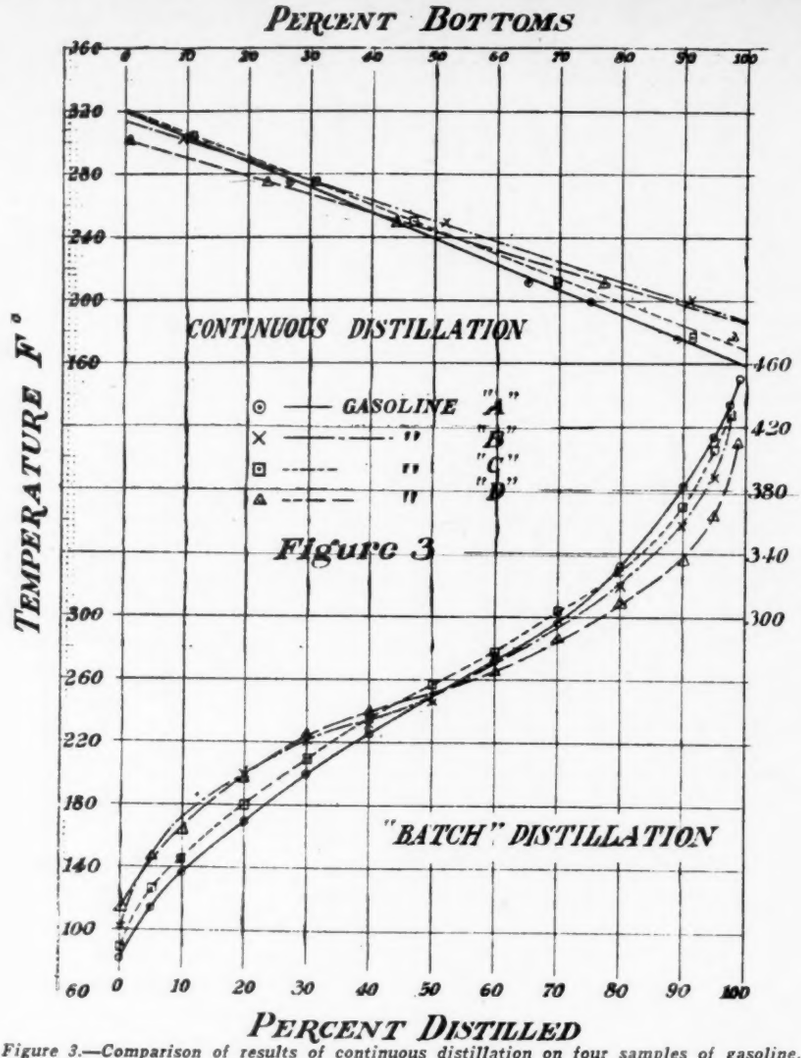


Figure 3.—Comparison of results of continuous distillation on four samples of gasoline, with results of present "batch" distillation test, the continuous distillation, in terms of per cent bottoms, being at the top of the chart.

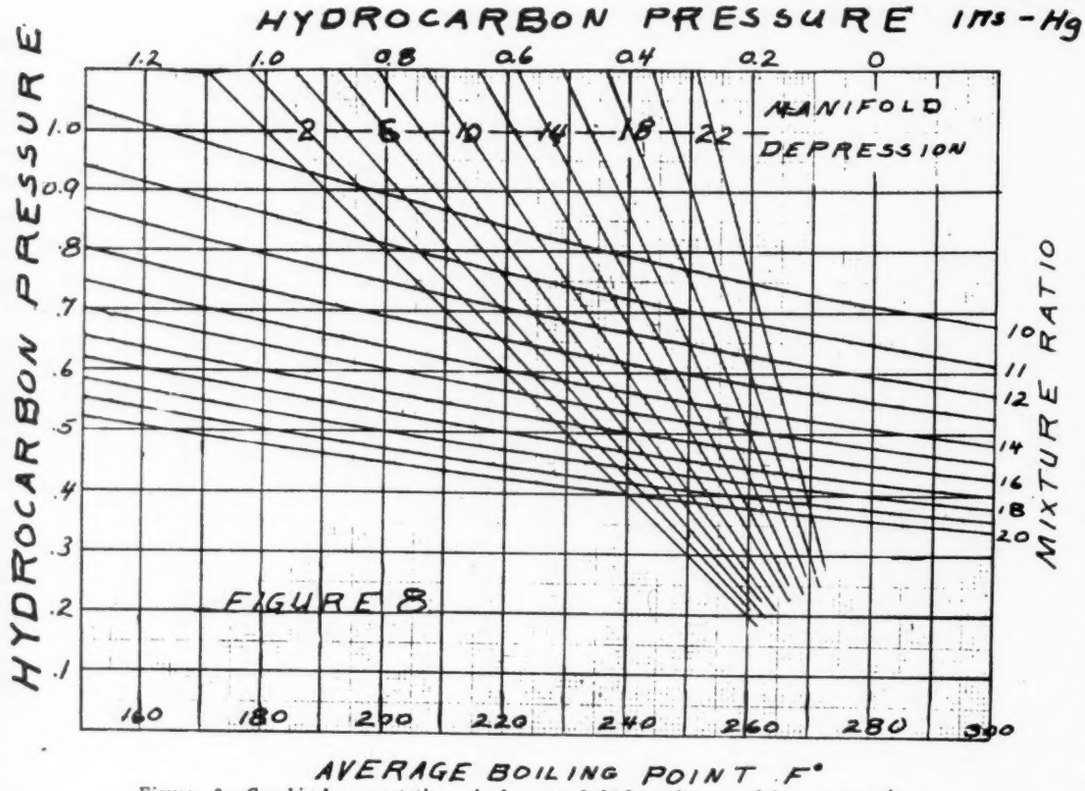
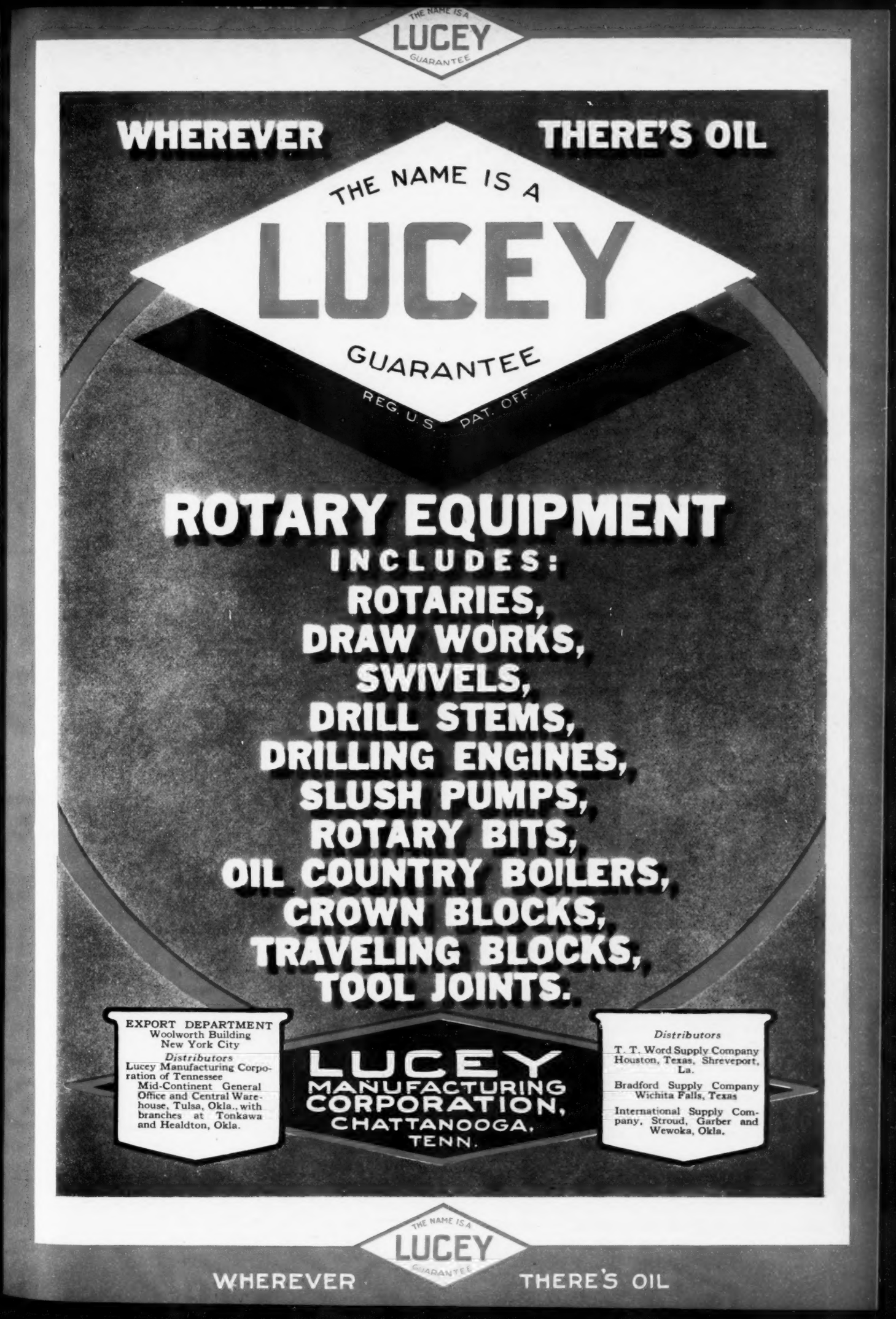


Figure. 8.—Graphical computation of the actual hydrocarbon partial pressures for a number of mixture ratios and manifold pressures.

illustrated. It will be noted that the points marked with triangles are not used in drawing the curves. It was found that when the gasoline was flowed through the apparatus too rapidly the percentage of bottoms was increased.

This would be expected and therefore the flow rate was reduced until a minimum value of bottoms was obtained. It was also found that when the percentage of bottoms approached 100 per cent the curve seemed to droop more than would be expected from the other points.

As the volume of vapor leaving the apparatus under these conditions was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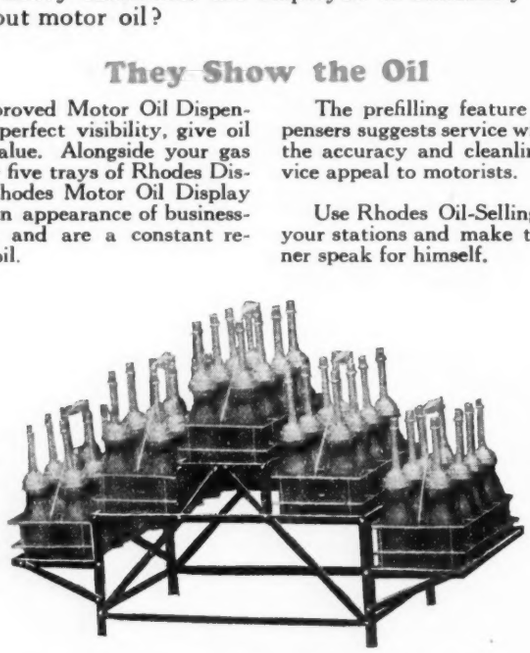

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markedly less than that at the higher temperatures it was believed that the presence of air in the flow tube was reducing the partial pressure of the gasoline. The end of the vapor condenser tube was therefore trapped and the percentage of bottoms fell more nearly on a straight line through the remaining points. When the test temperature was above that apparently necessary for complete evaporation of the gasoline there was no liquid in the trap at the end of the flow tube and therefore the vapors condensed partly in the bottoms cooler as well as in the vapor condenser.

Remedies Easily Found

The remedies for these three difficulties are obvious and easy of solution.

The effect of blending is illustrated in Figures 4 and 5. It will be noted that the 50 per cent point of the blend is the weighted mean of the 50 per cent points of the blended materials. It will also be noted that in the case of the domestic and absorption gasoline blends simple arithmetical calculations will give the blended curve from the two blended materials.

The temperature of zero percent bottoms of the 10 per cent kerosene and 90 per cent absorption blend can be computed from the zero per cent bottoms temperature of the kerosene curve reduced by the partial pressure of the vapor of the whole of the absorption gasoline. The ready determination of two or three points on a blended curve from the curves of the blended materials combined with the very approximate straightness of the lines makes the estimation of the volatility of blends relatively easy.

Line Approximately Straight

The volatility characteristics of a kerosene as indicated by the continuous distillation method are shown on Figure 5. The distillation range is less than in the batch distillation and the line is approximately straight as in the case of the gasoline.

The nature of the continuous distillation test is such as to suggest the possibility that the temperature leaving zero bottoms would be nearly the same as the vapor temperature of a continuous still, provided the liquid entrainment were negligible and the vapor stream were free from steam.

This might be true whether or not the vapor stream were passed through fractionating equipment. As a partial test of this possibility two gasolines were made using a small still fitted with a bubble tower. One cut was made at a tower temperature of 300° F. and the other at 350° F. It was noted that the temperatures of zero bottoms are 322° F. and 375° F. respectively.

As the cuts were made direct from crude which contained about 1 per cent of water the presence of the steam in the vapor stream from the tower reduced the partial pressure of the hydrocar-

bon vapor. Measuring the percentage of water in the overhead and computing the partial pressure of the gasoline the temperatures of zero bottoms become 297° F. and 352° F. respectively.

Refinery Control Temperature

This result may be considered a fair confirmation of the surmise that the overhead temperature of a fractionated vapor stream will correspond closely with the temperature of zero bottoms when the tower stream is free from steam. Also that the effect of steam can be corrected with reasonable accuracy.

From the point of view of the gasoline user, were it possible to estimate the effect of pressure on the temperatures of vaporization given by a continuous distillation test a reasonable estimate could be made of the manifold temperatures necessary for the vaporization of any proportion of the gasoline.

The estimation of the actual partial pressures of the hydrocarbon vapor in an air gasoline mixture is simple if the following factors are known:

(1) The molecular weight of the gasoline;

(2) The mixture ratio—i.e. ratio of weights of air and fuel; and

(3) The total pressure of the mixture in the manifold.

As the results of a continuous distillation test show an approximately linear relation between temperature and percent bottoms, it seems fair to assume that the temperature of 50 per cent bottoms is the average boiling point. The average molecular weight

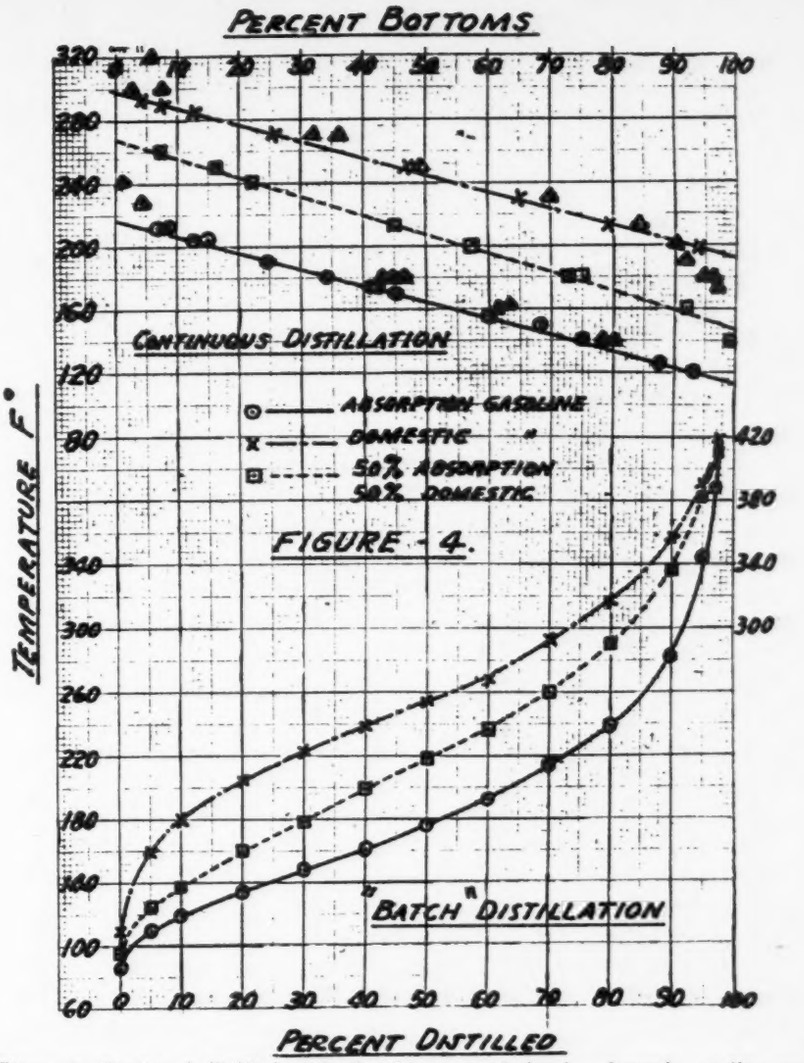

Figure 4.—Results of distillation test by the two methods of a domestic gasoline, an absorption gasoline and a 50 per cent blend.

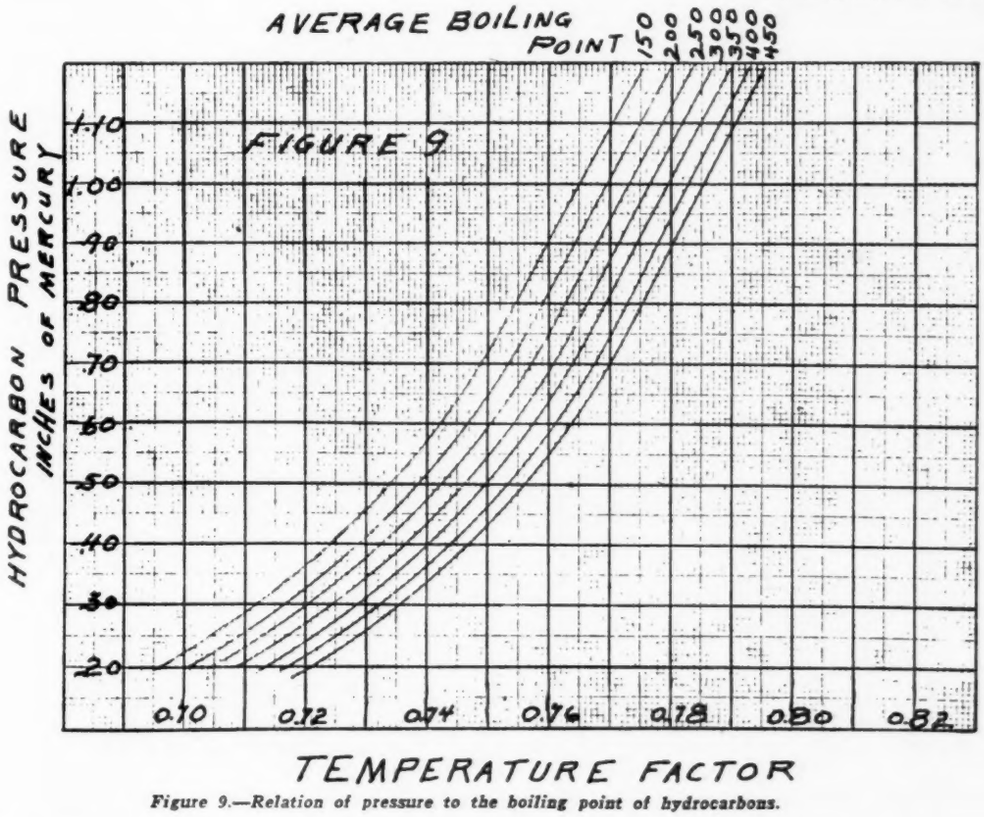

Figure 9.—Relation of pressure to the boiling point of hydrocarbons.

can then be estimated from the boiling points of pure hydrocarbons.

Curves Show Similarity

An examination will show a close similarity between the paraffins, olefines and cyclonaphthenes which probably represent the major proportion of the constituents of present gasoline.

The graphical computation of the actual hydrocarbon partial pressures for a number of mixture ratios and manifold pressures is given in Figure 8.

The values given in this figure are based on the mol ecular weight—boiling point relation of the olefines between 150° F and 350° F. The pressure scale at the left of the figure and the set of horizontal lines gives the partial pressure of the hydrocarbon vapor for any mixture ratio from 10 to 20 and any average boiling point from 150° F to 350° F.

(Continued on Page 93)

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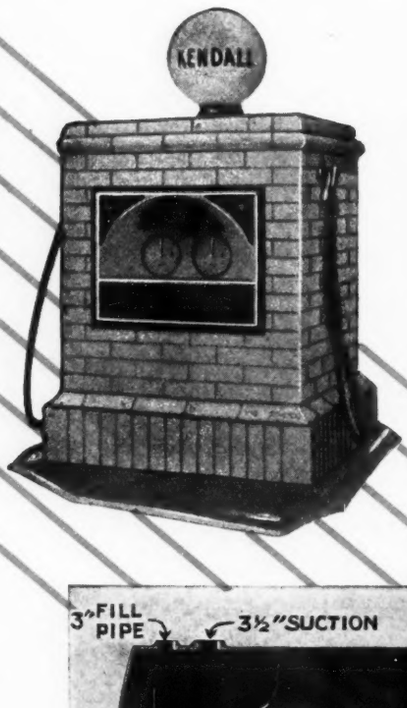
Fig. 251



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By Ward K. Halbert
N. P. N. Staff Writer

CHICAGO, Feb.15

FARMERS who parked their mud-spattered cars along the main street of a certain sizable middle-western town were not in the least excited by the sight of two tank trucks standing in front of the same garage. They saw it but they didn't understand it. It gave rise to no suspicion in their minds. Most of these farmers had seen both trucks many times so they were not surprised to find them stationed alongside in front of the Jones Garage. They didn't even notice that both trucks had a hose in the same tank.

It took an oil salesman who happened along in his little tin coupe to observe this unusual behavior. He sold lubricating oil in cans to the Jones Garage and he happened to know that his customer, Jim Jones, had only one gasoline tank buried there in front of his automobile repair shop. Moreover he had only one vending pump over that tank to serve the trade. The Jones garage sold nothing but Red Crown gasoline, bought of the Standard Oil Co. And yet there stood both those tank trucks, property of competitive companies, each with a hose in that tank. The lube oil salesman took out his handkerchief and rubbed his eyes.

It was none of his business but this salesman had curiosity, as so many good salesmen do, and he wanted more "dope." Why should the Standard Oil Co. and a competitor park their tank wagons at the same curb and stick their hose in the same tank at the same time? It seemed to justify an investigation and he made it—mostly with his pencil and a knowledge of oil prices and local competitive conditions.

A second look at the two trucks disclosed the first fact of importance. The Standard Oil Co.'s truck was dumping gasoline into the tank and the truck of the local competitor was pumping it out. There was no mistake about it. There was the Independent's truck driver loading his truck from the garageman's tank with a force pump operated by hand.

Bootlegger of Hicksville

A few well-worded questions directed at Mr. Jones and a little detective work in connection with some arithmetical gymnastics in his room in the hotel that night showed what was taking place in Hicksville. There are five gasoline bulk stations in town, more than are actually necessary to serve the trade. One of the two local companies there is a "bootlegger" of gasoline. It is a hard word but well understood.

The name of the proprietor is M. Hirsch, and he has been getting business by cutting prices for the last two years or so, according to the prevailing rumor. He got into the oil business with a free tank and pump and a 5-cent margin back in the summer of 1923. Now he has storage for two tank cars of gasoline, a two-pump filling station not far from his bulk plant and a small tank truck, more or less mortgaged. Mr. Hirsch is cross-eyed, has a drooping mustache and smokes cigars without keeping them lit. But he is shrewd and he gets by.

It was the tank wagon of the Hirsch Oil Co. that was busy taking on gasoline from the tank in front of the Jones' Garage when the lube oil salesman appeared on the scene. The second thing he inquired about was the refinery source of supply of the bootlegger. And so it was learned that Mr. Hirsch has no marginal contract. He is supposed to buy his material on the open market. And it further develops that his price-cutting tactics a few weeks back started a price war in Hicksville that utterly ruined the price structure there and in the country round about. Against a normal tank wagon price of 18.4 cents in Hicksville, the price on the day of the lube salesman's visit was 12 cents flat; service station price 14 cents, tax paid.

Easy Go, Easy Come

WHILE the statisticians figured, while the intellectuals reasoned, while the moralists codified ethical rules having to do with tht ubiquitous Q. D. A., a cock-eyed bootlegger in a hick town worked out his answer and did something about it. His doings are recounted in the accompanying article, not for your example so much as for your amusement, dear reader; it might not work twice.

In short, the bootlegger started a price war that ran until the Q. D. A. price of gasoline was under the Group 3 price and then he basked in the shade of the Standard's own "blind spot" and let somebody else pay his bills—all legal and businesslike. But read it. It is a true story with names, dates, and figures changed to protect the identity of a certain oil salesman who played the part of "Sherlock."

The Group 3 price of U. S. Motor gasoline was 10 cents a gallon, freight from Oklahoma to Hicksville roughly 3 cents, and tax 2 cents. That made a cost price on gasoline of 15 cents f.o.b. side-track in Hicksville. The "rock bottom" cost price then was 15 cents and the retail (filling station) price was 14 cents. If Mr. Hirsch sold nothing except through his own vending pumps at his own station at the prevailing "war price" he had a flat cash loss of 1 cent a gallon and overhead to bear on top of that. Tank wagon deliveries represented a greater overhead in his particular case and therefore a loss of 3 cents a gallon.

He Thinks Pointedly

This put Mr. Hirsch to thinking. He had gotten things to such a pass that it didn't do any good to cut prices and increase his volume of business. Under those conditions, the greater the volume the greater the loss. It was up to him to buy for less, and his necessity gave birth to a new and original idea. This is about what he did before he started getting his gasoline through the Jones' Garage. First he visited Mr. Jones and the following conversation took place:

Mr. Hirsch: "Say Jones, how much gasoline do you put through this here now pump of yours in the course of a month?"

Mr. Jones: "Oh, we run around 7000 or 8000 gallons."

Mr. Hirsch: "Well, that's too bad. You don't get in on this quantity discount agreement of the Standard's, do you?"

Mr. Jones: "No, we can't sell 10,000 gallons here."

Mr. Hirsch: "Well, suppose I bought 10,000 gallons a month from you, you would get your gasoline for 2 cents less, wouldn't you?"

Mr. Jones: "Yes."

Mr. Hirsch: "Well, if I take 10,000 gallons a month from you, come and get it myself, will you let me have it for just what it costs you? That would be 2 cents under the tank wagon price or just 10 cents a gallon at today's prices."

Mr. Jones: "That would allow me the gas I am buying now at 10 cents instead of 12 cents, wouldn't it?"

Mr. Hirsch: "That's right."

Mr. Jones: "Sure. I will trade with you that way."

The next move was to go over to Standard Oil Co.'s bulk plant in Hicksville where Otto Black was in charge. Mr. Black was not on a salary and Mr.

Refinery Products Directory

Gasoline and Naphtha

NORTH LOUISIANA

58-60 U. S. Motor Gasoline
Caddo Central Oil & Refining Co.,Shreveport,La.
Shreveport Prod. & Refg. Co., Shreveport, La.

OKLAHOMA

50-52 450 E. P. Naphtha
Cameron Refg. Co., Ardmore, Okla.
56-58 450 E. P. Gasoline
★Bolene Refg. Co., Enid, Okla.
Cameron Refg. Co., Ardmore, Okla.
58-60 450 E. P. Gasoline
★Bolene Refining Co., Enid, Okla.
58-60 U. S. Motor Gasoline
★Bolene Refg. Co., Enid, Okla.
Cameron Refg. Co., Ardmore, Okla.
60-62 400 E. P. Gasoline
Altitude Petroleum Co., Tulsa, Okla.
64-66 390 E. P. Gasoline
★Bolene Refining Co., Enid, Okla.
68-70 350 E. P. Gasoline
Altitude Petroleum Co., Tulsa, Okla.

PENNSYLVANIA

50-52 Naphtha
Emery Mfg. Co., Bradford, Pa.
54-56 Naphtha
Emery Mfg. Co., Bradford, Pa.
58-60 Straight-run Gasoline
Emery Mfg. Co., Bradford, Pa.
60-62 Straight-run Gasoline
Emery Mfg. Co., Bradford, Pa.
62-64 Straight-run Gasoline
Emery Mfg. Co., Bradford, Pa.
64-66 Straight-run Gasoline
Emery Mfg. Co., Bradford, Pa.
68-70 Straight-run Gasoline 305-320 E. P.
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
70-72 Straight-run Gasoline 300-305 E. P.
Emery Mfg. Co.. Bradford, Pa.

Natural Gasoline

OKLAHOMA

Grade A
Altitude Petroleum Co., Tulsa, Okla.

Burning Oils

NORTH LOUISIANA

41-43 Water White Kerosene
Caddo Central Oil & Refining Co., Shreveport, La

OKLAHOMA

41-43 Water White Kerosene
Cameron Refg. Co., Ardmore, Okla.
42-44 Water White Kerosene
Altitude Petroleum Co., Tulsa, Okla.

PENNSYLVANIA

45 Water White Kerosene
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
46 Water White Kerosene
Emery Mfg. Co., Bradford, Pa.

Neutral Oils

PENNSYLVANIA

150 Vis. No. 3 Asso. Filt.
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Seneca Oil Works, Warren, Pa.
150 Vis. No. 4½ Filt. (Red)
Crystal Oil Works, Oil City, Pa.
180 Vis. No. 3 Asso. Filt.
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Seneca Oil Works, Warren, Pa.
200 Vis. No. 3 Asso. Filt.
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Seneca Oil Works, Warren, Pa.
34 Gravity 350-360 Flash
Pennsylvania Oil Products Refg. Co., Warren, Pa.

Cylinder Oils

PENNSYLVANIA

600 Steam Refined
Crystal Oil Works, Oil City, Pa.
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
635 Steam Refined
Emery Mfg. Co., Bradford, Pa.
650 Steam Refined
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Seneca Oil Works, Warren, Pa.
600 Flash Steam Refined
Emery Mfg. Co., Bradford, Pa.
600 Warren E
Pennsylvania Oil Products Refg. Co., Warren, Pa.
600 Oil City E
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Cold Test Stock (bright filtered)
Pennsylvania Oil Products Refg. Co., Warren, Pa
Warr-Penn Refining Co., Warren, Pa.
Cold Test Stock (dark filtered)
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Warr-Penn Refining Co., Warren, Pa.
Black Oil
Emery Mfg. Co., Bradford, Pa.

Motor Oils

PENNSYLVANIA—100% PURE

Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
Seneca Oil Works, Warren, Pa.

Greases

Cup Grease
Richardson Lubricating Co., Quincy, Ill.

Wax

PENNSYLVANIA

122-124 White Crude Scale
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa.
124-126 Crude Scale (off white)
Crystal Oil Works, Oil City, Pa.

Fuel Oils

NORTH LOUISIANA

14-18 Fuel Oil
Caddo Central Oil & Refining Co.,Shreveport, La.
32-36 Gas Oil
Caddo Central Oil & Refining Co.,Shreveport,La.

OKLAHOMA

32-36 Gas Oil
Cameron Refg. Co., Ardmore, Okla.
24-26 Zero Fuel Oil
Altitude Petroleum Co., Tulsa, Okla
34-38 Straw Distillate
Cameron Refg. Co., Ardmore, Okla.
38-40 Straw Distillate

PENNSYLVANIA

36-40 Fuel Oil
Emery Mfg. Co., Bradford, Pa.
Pennsylvania Oil Products Refg. Co., Warren, Pa

Petroleum Coke

Shreveport Prod. & Refg. Co., Shreveport, La.

Hirsch knew it. Mr. Black is what is known as a "B Station" manager. He gets 2 cents a gallon on all the gasoline that runs through its bulk plant. Volume means something to Mr. Black. So Mr. Hirsch approached Mr. Black in a slightly different way.

Mr. Hirsch: "Say, Otto, I am going to buy my gasoline for a while through some curb pump dealer. My cash reserve is a little short and my storage is empty and I have lost most of my tank wagon customers. But I want to get enough gasoline for my own filling station and I am going to pick it up from some garage man so as to help him get his volume up where he can get in on the Q. D. A. Now I would love to buy from this here customer of yours, Jones, if you will be reasonable about it."

Mr. Black: "Hell's bells, you and Jones for that. Why ask me?"

Mr. Hirsch: "Well, all these other big company managers in town here are on a 2-cent commission and so are you. If I buy 10,000 gallons of gasoline from Jones that's $200 a month in your pocket. Now I will be durned if I am going to hand you $200 a month. But I will buy from Jones if you will give me 1 cent off on all the gasoline I take."

Mr. Black: "You want me to split my commission with you!"

Mr. Hirsch: "Any of the other fellows, Sinclair or Shell or any of them, would do it. Of course, I'd a little rather do business with Jones. And then too, Red Crown is good gasoline."

Mr. Black: "I will do it, Hirsch, if you will keep your damn mouth shut and sell under your own brand."

Mr. Hirsch: "That's a trade now, Otto. I'll start tomorrow."

Who Pays the Commissions

So in this way Mr. Black, the "B Station" manager gets his pay increased by $100 a month with commissions on new business. Mr. Jones, the garage man, gets a 2-cent cut on the tank wagon price of the gasoline he normally handles. And Mr. Hirsch, the bootlegger, gets his gasoline for 9 cents a gallon. As an additional favor to his benefactor Otto Black, the brilliant Mr. Hirsch asked his few remaining tank wagon customers to buy from the Standard. "I am having to buy their gas now myself, so it will be all the same to you," he told them.

This left Mr. Hirsch with a two-pump filling station doing roughly 10,000 gallons a month. His gasoline cost him 9 cents and his retail price was 14 cents. His spread was 5 cents a gallon. All he had to do was go down to the Jones Garage and get it.

But the best part of the story is still not told.

Jones and Black were both willing for Hirsch to have just as much as he needed. They didn't interfere with his purchases. Instead of taking 10,000 gallons a month he took 20,000 gallons and

filled his empty storage from Jones' tank through his own little tank truck at 9 cents a gallon when the Group 3 spot price was 10 cents. And besides he saved 3 cents a gallon freight. And when his tanks were filled he didn't quit buying from Mr. Jones. He just kept on taking his requirements.

All during these sad weeks Mr. Hirsch kept his price exactly in line with those of the Standard Oil Co., and "kussed" the other oil men in town for carrying on the war which he started himself. After a while the price war ended, and normal prices were restored. Now Mr. Hirsch has two tanks full of 9-cent gasoline which he can sell through his filling station at the normal retail price of 21.4 cents.

And rumor has it that he is out soliciting tank wagon customers again, giving price concessions for business as before. He is not getting any more gasoline from Jones, but he should "bibble."

Gasoline Testing Method Assisted by Engine

(Continued from page 89)

The pressure scale at the top of Figure 8 and the vertically inclining group of lines reduces the partial pressure of the hydrocarbon vapor from that of a total pressure of 29.92 inches of mercury to that of manifold depressions from 0 to 22 inches of mercury.

In order to estimate the effect of reduced pressure on the boiling points of hydrocarbons, the approximate relation suggested by Walker has been used. Walker suggests that the ratio of the boiling points on the absolute temperature scale of one compound at two pressures was the same as that of a second compound of the same structural series. This relation has been plotted in Figure 9, based on published vapor pressure data for the paraffin series.

The Temperature Factor

The "temperature factor" given on Figure 9 is the ratio at the absolute boiling point at the pressure given to the absolute boiling point at atmospheric pressure.

The use of Figures 8 and 9 can be illustrated by an example. Assume gasoline "A" Figure 3. Its average boiling point is 240° F. With a mixture ratio at 12-1 and a manifold depression of 2 inches of mercury, the hyrocarbon vapor pressure in the manifold from the horizontal lines and left hand scale of Figure 8 will be 0.67 inches of mercury.

The temperature of zero bottoms for this gasoline is 320° F. or (320 plus 460) 780° absolute.

The "temperature factor" is 0.759, and the absolute temperature at 0.67 pressure is 0.759 x 780 = 591° absolute.

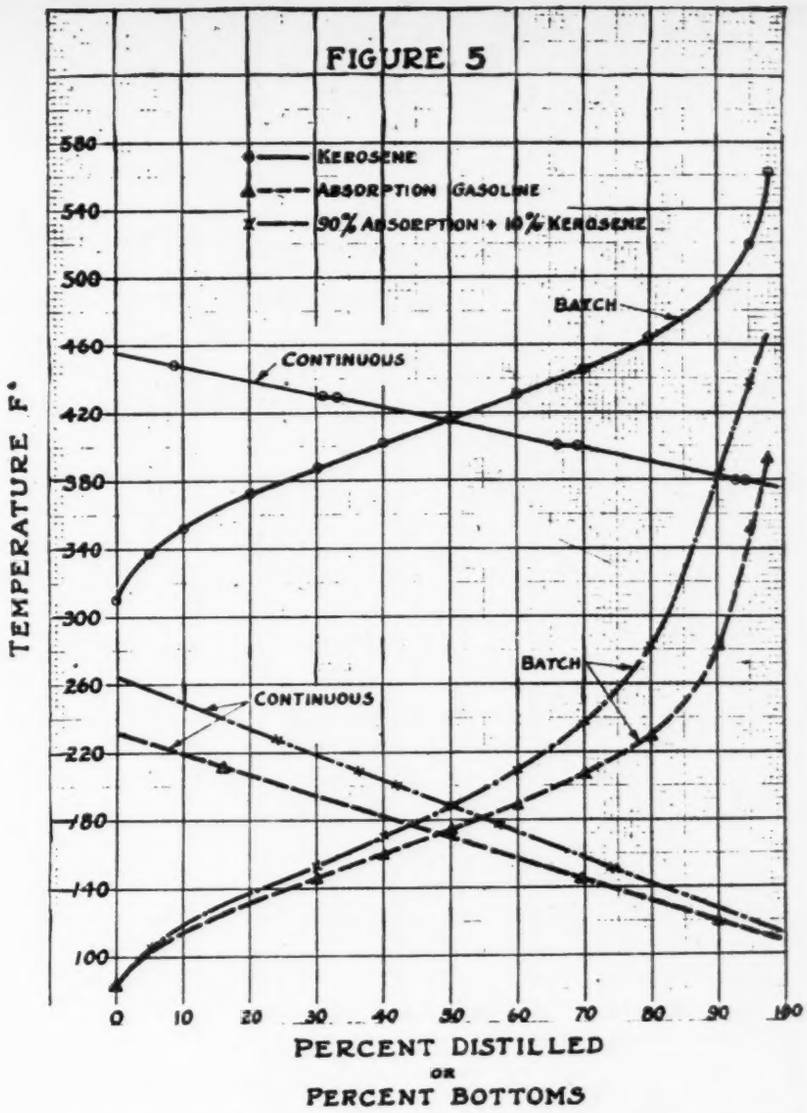

Figure 5.—Effect of blending 10 per cent kerosene and 90 per cent absorption gasoline, curves taken by both methods of taking distillation test being shown.

The manifold temperature requisite for complete vaporization is therefore 591 - 460 = 131° F.

The average boiling point at the first 20 per cent distilled of gasoline "A" is 175° F. At a vapor mixture ratio of 18 to 1, about the limit of explosibility, and a manifold depression of 20 inches of mercury, about the cranking manifold depression, the hydrocarbon vapor pressure will be about 0.18 inches of mercury, from Figure 8.

The temperature of 190° F., at which 20 per cent of gasoline "A" will be vaporized, at atmospheric pressure will become 0.696 x 650 = 452° absolute, or -8° F. From Figure 9. This fuel should therefore give a satisfactory start at about 0° F. and show little crankcase dilution at normal engine temperatures.

In view of the foregoing it is believed that a continuous method of distillation for the testing of gasolines should receive serious consideration as a testing method for gasoline. Its use will:

(1) Relate still vapor temperatures to finished gasoline characteristics;

(2) Simplify blending to desired characteristics; and

(3) Assure to the user a product meeting his requirements.

Briefly, its use should give rise to the development of a definition of gasoline volatility acceptable to both producer and user.

Lower Nebraska Rates Sought

OMAHA, Feb. 13.—The Omaha Freight Traffic Association has started a campaign for lower intrastate freight rates for the benefit of Omaha shippers. Much of the spirit in the movement came as a result of the announcement recently by a rate expert that the freight on a carload of oil from Omaha to Bridgeport, Neb., is twice the cost of shipping the same car of merchandise 800 miles in Kansas. Considerable agitation has resulted to encourage the development of local markets for Omaha manufacturers. "No doubt the freight rates put the Omaha refinery out of business," the traffic man says.

IT is only natural for us to appraise intrinsic worth by external appearance.

Take the motorist as an example. When he draws up to a good-looking G. & B. pump for gas, he takes it for granted that the enclosed mechanism, even though concealed, is in keeping with the fine outward appearance of the pump.

And he is right. G. & B. construction leaves nothing to be desired. It embodies precision and accuracy, speed in delivery, safety, simplicity, in fact, everything that promotes good service and dependable performance.

This folder on the G. & B. air-operated pump shows how you, too, can enjoy the benefits of modern labor saving devices in your business. A copy is yours for the asking.

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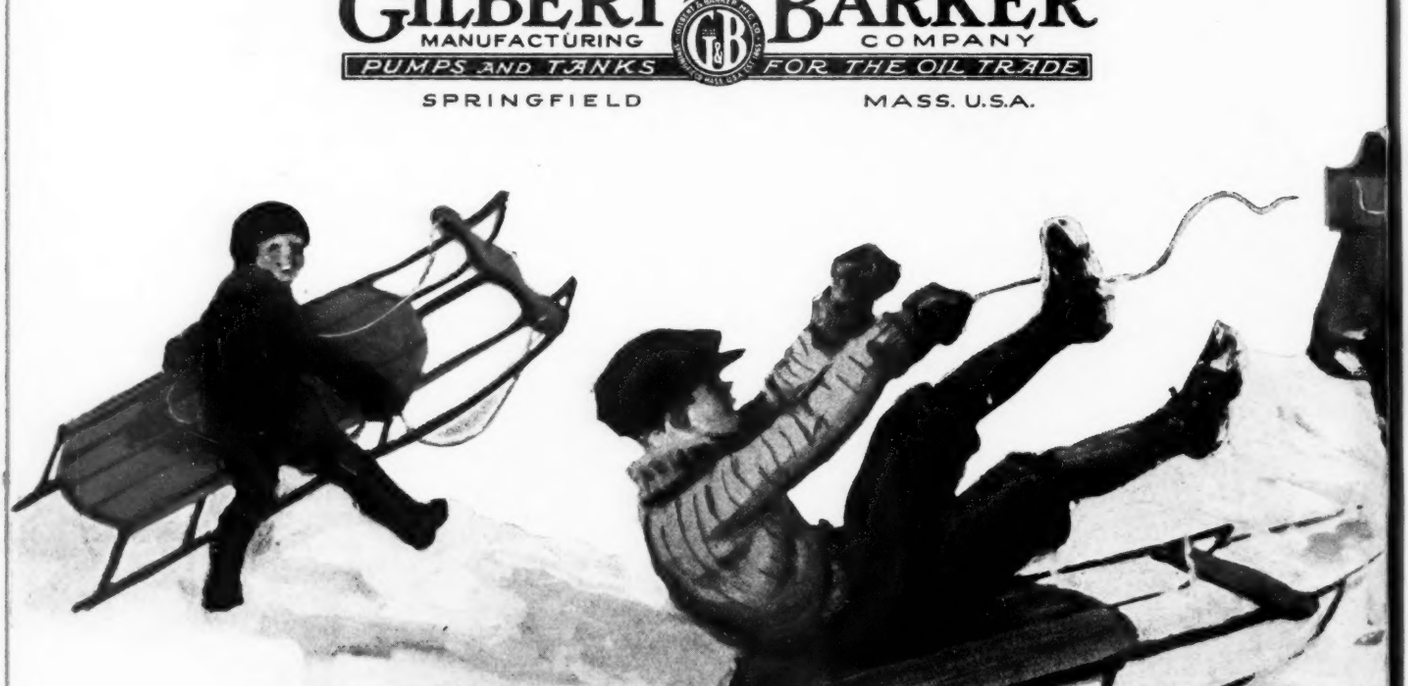
MANUFACTURING COMPANY
PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD MASS. U.S.A.



·PUMPS THAT HELP YOU SELL·

Colombian Government Cancels Barco Title

CLEVELAND, O., Feb. 12.—The government of Colombia has cancelled the Barco concession, in which the Gulf Oil Corp. recently acquired a 75 per cent interest. Such report has been received by the Gulf.

The action was taken through resolution drawn by the Colombian Minister of Industry, approved by the President, setting aside the title on the ground that conditions upon which it was originally granted had not been fulfilled.

The property consists of some 1,300,000 acres in the Maracaibo Basin west of the Venezuelan boundary. The original grantee, Barco, obtained title in 1905, conditioned upon filing geological map within one year and starting development work within three years. In 1918, title was transferred to Colombian Petroleum Co. (75 per cent) and Carib Syndicate (25 per cent). Colombian Petroleum is a Doherty company and its three-quarters was the part acquired by Gulf, such acquisition being in the nature of an option to buy, with a cash payment being made and more being presently due.

There is an overriding 15 per cent royalty in the entire concession, retained by the Barco family and now controlled by the American Maracaibo Co.

The next step probably will be taken in Colombian courts, for the Gulf believes the concession terms were fully complied with originally, as the concession was recognized as being in full force in 1918, ten years after the year when Barco was to have carried out his part of the agreement with the government.

A. M. Pate Heads Panther Sales

FORT WORTH, TEX.—A. M. Pate, vice president of the Panther Oil & Grease Mfg. Co. of this city, is now permanently located and actively in charge of sales at the company's general office here, according to Carl Wollner, president.

Mr. Pate has been actively associated in the lubricating oil and grease industry in this country for the past 15 years, excepting during the period when he served overseas during the war. He has been in the sales end and has covered every state in the south.

The Panther company, although only four years old, is composed of men who have long been in the oil and grease trade and it has at the present time, 14 salesmen covering every southern state.

A site was recently purchased by the company here on which will be built a modern oil and grease plant when its lease on the present factory expires.

CHICAGO.—Falley Petroleum Co., located for five years in the First National Bank Bldg. here, has moved into more commodious quarters in the same building which has recently been enlarged.

Oil And Grease Formulas

200 formulas, modern in every particular, have been prepared in a simple, non-technical style by Forrest A. Hoff.

They are of value to the refiner, jobber, compounder, broker and lubricating engineer.

Just attach your check to this ad and return it to us now. $50 is the reasonable cost of all this valuable information. Synopsis sent upon request.

National Petroleum News
830 Caxton Building **Cleveland, Ohio**

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No. 448 Type "H" Hose Nozzle Valve

Patent Applied For

THE Buckeye Type "H" Hose Nozzle Valve meets all the requirements of the Underwriters' Laboratories and has been listed as Standard by them, their Miscellaneous Hazard Report No. 1460 dated November 14th, 1925.

High-grade brass is used throughout in the construction of this valve. A guard, cast in one piece with the body is provided to protect the operating lever.

The operating lever passes through a cored opening in the body and is pinned between two lugs on top of the body. This unique construction gives a greater leverage with more direct pressure on the stem than it is possible to secure in any other way. The disc is a composition material specially made for use in gasoline.

Actual tests have proven this to be an exceptionally fast delivering valve. Other Buckeye Products such as Foot Valves, Bushings, Fill Caps, and a great many other kinds of Filling Station Equipment are described in our new catalog, copy of which will be sent upon receipt of the coupon below.

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Please send me further information and prices for Buckeye Filling Station Equipment.

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Building a Market for Heavy Oils On the Pacific Coast

By J. B. Arthur,
Union Oil Co. of California

Delivered Before A. P. I. Convention at Los Angeles, Jan. 21

IN NO place is the question of oil fuel as vital as in California, for here oil is "coal" to a greater degree than obtains in any other American region. Without oil California would be in utter economical dependence on imported coal, so it is but natural that the use of oil fuel should have been pioneered on a commercial scale in this state.

Although commercial crude oil production on the Atlantic seaboard antedated the discovery of the product here, the use of fuel oil for industrial and domestic purposes there has yet to attain the universality that attends the product on the Pacific Coast. Not only is this because of the predominance of the oil here and at the same time the lack of coal reserves within the state, but to a large degree the reason lies in the character of the California crudes, which produce a larger yield of fuel oil than those obtained elsewhere in the United States.

The recorded production of petroleum in this State dates from 1876, when approximately 12,000 barrels were produced. Contrast this with last year's output of crude, estimated at about 230,000,000 barrels, and you get some idea of the tremendous strides that have been made by the industry in California.

It is estimated that of our current production about 70 per cent finds its way into the market as fuel oil in some form. Under this general heading I am considering heavy crudes that are not refined, the regular run of residuum fuel oil, as well as gas oil, diesel oil, smudge oil and stove oil, or as it is sometimes called, stove distillate or furnace oil.

Some of the heavier oils produced are utilized as fuel in their crude state, but the quantity of crude so marketed is negligible compared to the bulk of the output, which consists of refinery residuum. In fact, I am informed that in 1924 not more than 10 per cent of the petroleum produced in California was consumed in its natural state. This in itself shows distinct progress in the economies of the industry, as reference to the report of the Committee on Petroleum, California State Council of Defense, published in 1917, states that 60 per cent of the petroleum produced at that time was put through refineries before marketing, leaving 40 per cent to be marketed in its crude or natural state.

Analysis of Distribution

At the time this is being written I understand that the Bureau of Mines is engaged in making an analysis of the distribution of fuel oil on the Pacific Coast as between industries. Pending the issuance of this data, I do not want to make a lot of guesses, but will try and give a general idea of the distribution during 1924. In that year the total consumption of fuel oil, including that exported and shipments to the Atlantic, is estimated at 122,000,000 barrels, and this is about the way I would divide it:

Bunker	35,000,000
Railroads	32,000,000
Power plants, including street railways	7,000,000
Exports	18,000,000
Alaska and Hawaii	3,000,000
Atlantic and Gulf ports	1,000,000
Company operations	5,500,000
Gas-making plants	5,000,000
Cement plants	3,000,000
Shipbuilding plants and steel mills	1,500,000
Sugar mills	1,300,000
Smelters and mines	1,200,000
Logging and lumber	1,000,000
Packing, canning and refrigerating plants	500,000
Other uses	7,000,000
Total	122,000,000

The use of fuel oil in power plants is determined largely by the amount of water available for hydro-electric plants, as the consumption of fuel oil fluctuates widely. For the five Pacific Coast States, in 1920, it was 6,000,000 barrels; 1921, 3,700,000 barrels; 1922, 3,000,000 barrels; 1923, 3,900,000 barrels; and 1924, a little better than 7,000,000 barrels. From the figures for the first ten months of 1925, it looks as if the 1925 consumption would be about 3,000,000 barrels.

The amount of fuel oil used for gas-making purposes is of course determined by weather conditions, though in Southern California we also have another factor, i. e., the amount of natural gas that may be available.

Approximately one-half of all the fuel oil exported from the United States in 1924, (excluding bunker oil on ships engaged in foreign trade) was California fuel oil. Approximately 18,000,000 barrels of fuel oil were exported, which supplied almost the total requirements of Japan, China, western Mexico, the western coast of Canada, Chile and the Philippine Islands. By "total requirements" I mean total imports of fuel oil into these countries, which is a better description, as some of these countries have some production of their own.

Fuel oil, as marketed on this Coast, varies in gravity from 13½ to about 22 Baume, and for the most part falls between 15 and 18. It has always been the object of the company which I represent to educate the consumer to handle the heaviest grade of fuel oil that might be available, and I think it is important that the industry in general should have the same object in view. It is well known that the buyer gets more for his money if he is properly equipped to burn heavy gravity oil than is the case if his facilities are so constructed that lighter oil is demanded.

Fuel oil is sold by volume and not by weight, and reference to a chart of relative B. T. U. values will show that while the heat units per pound are greater in the lighter oils, the situation is reversed on a per barrel basis. This is not merely theory, but is demonstrated in actual practice.

Push the Heavier Grades

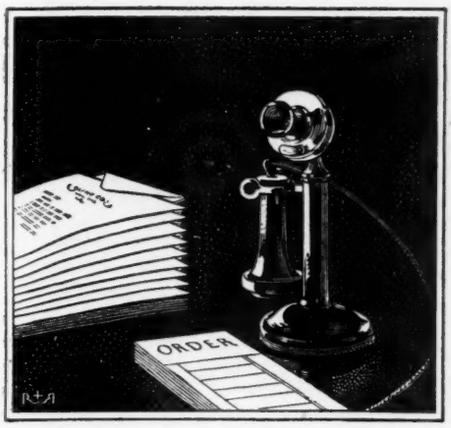
In emphasizing this at the present time, I have especially in mind the increasing popularity of the diesel engine, and the demand for gas oil for use in cracking operations. Both of these demands will call for increasing quantities of the lighter fuel oil cuts, and furthermore, as cracking becomes more general on this coast, the residuum that is available as fuel oil is bound to be lower in gravity than in the past. I might call attention to the fact that, although Pacific Coast stocks of all products have increased at the average rate of over 2,000,000 barrels per month during the past year, the total increase in stocks of refinable crude for the first eleven months of 1925 (December statistics not having been published as yet) amounted to only 3,500,000 barrels, while during the same period stocks of crude under 20 gravity were increased by nearly 25,000,000 barrels. If this condition continues, there is no question but that fuel oil consumers will have to use heavier oil than has been furnished in the past, and we should be paving the way now by educating the consuming public.

Practically all fuel oil contracts merely specify a minimum gravity of 13½ or 14 Baume, though some marketers make it a practice to raise the minimum gravity specification, and others give written or verbal assurance that they will deliver oil of a higher gravity. This is bad practice, as the consumer who cannot handle the ordinary run of fuel oil, and must have a special product to meet certain conditions, should not be classed as a fuel oil consumer, but should be sold a lighter product to meet his particular requirements.

For instance, there are some types of domestic burners adapted for use in residences and other small buildings, and these are not designed to handle heavy fuel oil which requires heating to make it flow readily, and steam for atomiza-

After five years of writing

a $40,000 order on the *first* long distance call



FOR 5 YEARS a New York concern wrote a southern construction company trying to get a first order for finished material in carload lots. Twice each year the sales manager mailed prices that he knew were right. No response. Finally, when the semi-annual request for quotations came in, he reached for his telephone and got the purchasing agent, a thousand miles away, on the wire. Prices and conditions were discussed and he took the order then and there. It amounted to $40,000!

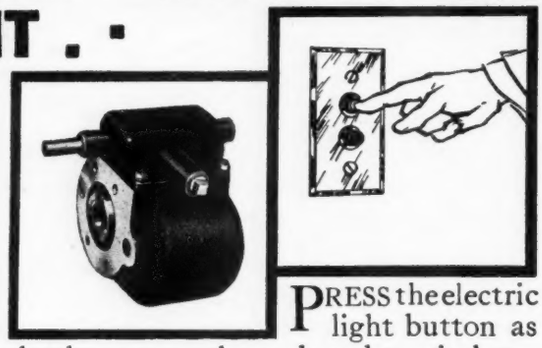
IN THOUSANDS of businesses today the long distance telephone is getting results that otherwise would be lost. Long Distance cuts out waiting and gets the answer. It gets immediate consideration for important matters. It gets past closed doors, for its mission is obviously to serve. Many times Long Distance gets first orders where all other means have repeatedly failed to get an audience.

Have you studied your own business to see how many telephone opportunities are being neglected? Is the telephone used only in an emergency, or are your department heads and the members of your sales staff trained to use Long Distance regularly to cut expense, to make sales or purchases that otherwise could not be made? Long Distance has a place on the program of every business that has or wants more than a local territory.

The Commercial Department of the Bell company will gladly, upon call, make a study of your business and suggest a regular plan for long distance calls. In the meantime, what far-distant man or concern would you like to talk to? The telephone on your desk will connect you, just as it does with anyone wanted in the next town or the next building. . . . *Number, please?*

BELL LONG DISTANCE SERVICE

THE FULLER
AUXILIARY TRANSMISSION
FOR FORD TRUCKS
SHIFTS LIKE TURNING ON THE LIGHT . .



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Four Speeds Forward — Two Reverse.
No Neutral Position (Brakes Always Available).
No Added Strain on Motor. Universal Joint, or Drive Shaft.
No Rebuilding Necessary; No Cutting of Drive Shaft.
Installation, 2 to 3 Hours, No Special Tools Needed.
Very Simple and Easy to Operate.
Built by Fuller; Largest Manufacturer of Truck and Bus Transmissions in the World.
Fully Guaranteed for 90 Days Against All Defects.
Price—$60 to Truck Owner.

PRICE $60

F. O. B. Factory
Plus 2½% War Tax
$5.00 Additional
West of the Rockies

PRESS the electric light button as slowly as you please, but the switch action is quick as a flash. The light is either on or it's off. There is no half way stop.

The FULLER Auxiliary Transmission shifts like that. Move the lever as slowly as you please, but when the shifting point is reached the gears shift instantaneously. There is no half way (neutral) stop.

This unique action, found only in the FULLER, is of great importance as a safety feature for tank trucks and other Ford Trucks used in the Oil Industry. With the FULLER it is impossible to become "stranded in neutral" when shifting gears on a hill, for the service brake is always connected to the rear wheels. You do not have to purchase auxiliary brakes to insure the safety of your trucks. The FULLER is a money saver in the Oil Industry, for it gives your trucks 80% more pulling ability, and the flexibility of four speeds forward and two reverse. Equipped with this unit your trucks will make the best time possible, on the level, and when carrying heavy loads over bad roads.

Ask your Ford Dealer for further information about the FULLER.

FULLER & SONS MFG., Co.

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TRANSMISSION BUILDERS FOR 22 YEARS

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by Ellis and Meigs, is a book which gives a complete survey of the field and a description of practically every process of making gasoline and most other motor fuels of promise or prominence.

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National Petroleum News, 807 Caxton Bldg., Cleveland, Ohio

tion. The cost of such an installation is prohibitive for the heating of a small building or residence. For such apparatus, an oil similar to that developed for use in diesel engines, or the still lighter product variously known as stove oil, stove distillate or furnace distillate, is more adaptable.

The diesel engine derives its name from its inventor, Dr. Rudolph Diesel, who in 1897, after years of difficult experimental work, completed the construction of the first commercially successful motor at Augsburg, Germany. It was nearly fifteen years later, however, before it was considered practical to use this type of power for the propulsion of large ships. The first diesel-engined ship to arrive on this coast was the M. S. Siam, of the East Asiatic Company, in 1914.

Demand Increasing

When it is considered that in that year Lloyds' Register listed 27 ocean-going ships equipped with diesel engines, whereas at present there are over 800 vessels, exclusive of small craft, aggregating about 1,500,000 S. H. P., it will be seen that the diesel engine has served its probationary period. While we have not made a complete survey, it is estimated that the annual use of diesel oil on this coast, afloat and ashore, amounts to about 1,500,000 barrels.

In Southern California, we boast of our climate, and rightly so, but there are times when in some localities we must supply artificial heat to save our fruit crops, and the same procedure is followed to some extent at other points along the coast. Smudge pots or heaters are spaced throughout the groves and orchards, the capacity of each pot being between 5 and 10 gallons, and these are filled with an oil similar in character to that marketed as diesel oil. It is sometimes unnecessary to light these heaters during an entire season, but there are sometimes as many as three or four cold snaps during the winter, and the orchard or grove that is properly equipped is insured against the loss of a crop, as the heat engendered by the lighting of these pots is very quickly disseminated and the atmospheric temperature raised to the point of safety. While the volume of oil used for orchard heating is not very large, averaging about 200,000 barrels per season, I thought it worth mentioning because of its general interest.

Fuel oil produced in California is normally distributed from Alaska in the north to Chile on the south, and westward to the Hawaiian Islands and the Orient. On account of freight differentials, very little is railed farther east than Arizona and Nevada. Distributing facilities throughout this territory are very complete, as storage is maintained by the oil companies at all principal centers of distribution, and the consumer can be quickly supplied with his requirements, either by pipe line,

(Continued on page 102)

Scouting the Lobbies

National Petroleum News

"WE SEE by the papers" that James O. Lewis has told the Federal Oil Conservation Board that it is possible to go back into what we may term the residue fields—those approaching the stage of exhaustion on an ordinary operating basis—and recover from them a barrel of oil for each barrel that has been taken out.

If the quotation is approximately correct it sounds like a large assignment. No one now present will be able to make a final reckoning to see whether Mr. Lewis's reckoning is in plumb or on the bias, speaking for the present grand total of eight billion barrels the operators would have to match.

Instances there are at hand, though, to indicate that he is not merely guessing. His observations are based chiefly upon the application of air pressure or natural gas under pressure to oil sands. Enough work has been done along this line to show the results that may be obtained. Within the past two years there has been a real start made in the Mid-Continent fields at doing what operators in southeastern Ohio, West Virginia and Pennsylvania have been doing for years.

The Board got hold of a qualified witness when it called in Mr. Lewis, for the rejuvenation of old fields by restoring pressure has been his major life work and his authoritativeness is established. He was educated in geology but the business of adding to the effective method of producing oil early captured his attention. He joined the U. S. Bureau of Mines and made a number of important investigations. The one for which he is best known is that on methods of increasing oil recovery. This was the first detailed and thoroughgoing report along this line available to the public.

Not long after this report was made, Mr. Lewis formed an associatioin with Smith & Dunn, of Marietta, O., pioneer practitioners in the art of applying compressed air to oil sands. This association continues, with Mr. Lewis's name as part of the firm.

Once the Smith & Dunn people held patents on the method but the courts ruled adversely on them. There has been no noticeable decrease in the scope of their activities; possessing, as they do, a great fund of knowledge on the subject, they have been busy as consulting engineers and as managers of properties. They have stayed close to the subject of compressed air, adding to the range of application by introducing the method of cleaning out wells with air and by installing air lifts in oil wells. One of the notable pieces of planning they have done is now in process of execution in the Delaware Extension field of Oklahoma, where a number of operators joined in restoring pressure on the entire field, with Messrs. Dunn and Lewis playing a prominent part in working out the details of the installation and supervising the operations.

E. L. DeGolyer

BACK in 1919 E. L. DeGolyer was commissed by the Lord Cowdray interest to form an oil producing company in the United States. Adequate funds were placed at his disposal and he was given free hand, for he had long before worked to a position of responsibility and trust with the Lord Cowdray people in Mexico.

In selecting a name for the new company, it was decided to make it embrace the greater part of North America. Hence, "Amer" was taken from America and "ada" from Canada and the company was called the Amerada Petroleum Corp., of which Mr. DeGolyer became vice-president and general manager. He has, with the late sale of control by the founders to Bankers Dillon, Read & Co., been made president and will continue to be the general manager.

Mr. DeGolyer is a Kansan. He was born in Greensburg in that state on Oct. 19, 1886. He chose the University of Oklahoma when it came time to go to an institution of higher learning and was graduated there. He spent three years as a field assistant on the U. S. Geological Survey, doing work on coal in Wyoming, Colorado and Montana. In 1909 he came into the oil business as a field geologist for the Mexican Eagle Oil Co., later becoming chief geologist and head of the land department and so remained until Lord Cowdray sold that company.

The success of the Amerada company is noteworthy. It has each year since its formation made substantial increase in its production and in 1925 the total reached nearly four million barrels.

Mr. DeGolyer is at this time the president of the American association of Petroleum Geologists, first vice-president and director of the American Institute of Mining & Metallurgical Engineers, and member of a number of other scientific societies.

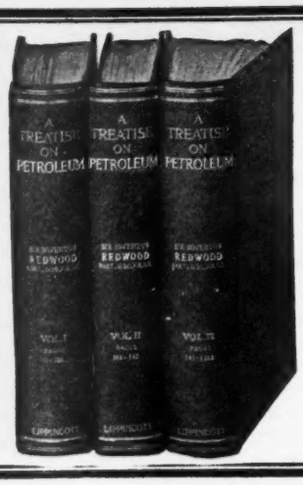
He has undertaken at various times valuation and appraisal work for other companies. One such assignment was participation in the appraisal of the holdings of the Union Oil Co. of California for the purpose of assigning proper value to the stock in that company held by the Shell interests, which the latter decided to sell.

Mr. DeGolyer is also vice-president and operating head of the Rycade Oil Corp., operating in Texas, and is president of the Geophysical Research Corp. His home is in Montclair.

SOME 20 years ago H. W. March lived in Chagrin Falls, O., a village southeast of Cleveland. He went away and stayed away for that length of time and now he is again a resident of the village. When he left he was a youngster living there with his parents; now he has established his own residence there.

This location is within easy driving distance of the plant of the Damascus Manufacturing Co., of which Mr. March is now the general manager. The Damascus, a grease manufacturing company which was started several years ago, was purchased in 1925 by interests centering around John W. Leonard, of Washington, Pa. Mr. March, an old friend of Mr. Leonard's, was called from his place as general manager of the Neha Refining Co., a Kentucky company with headquarters in Lexington, to take charge of the Damascus plant. Certain reorganizations and enlargements have been effected and others are under way.

Mr. March, a graduate some years ago of Western Reserve University, Cleveland, tried newspaper reporting in Cleveland for a time but reformed and got into the oil business. Past connections include the Beaver Refining Co., whose plant is at Washington, Pa.



Information on all branches of the petroleum industry is to be found in the 4th edition of A TREATISE ON PETROLEUM by Sir Boverton Redwood.

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(Continued from page 100)

steamer, barge, tank car or tank truck, as desired.

Incessant change is the order with oil. The industry is reared on the hazard of output, and a study of its history will show that there has been alternate under-production or over-production — the proverbial feast or famine. The problem of correlation of supply and demand has ever been present, and is perhaps the most acute of the many that loom ahead. The distribution of fuel oil has become a super-industry, touching every individual, no matter what his station, in some way; directly or remotely. A thorough knowledge of its history and its utilization, and a unified effort to standardize the product and encourage economy in is use and distribtution, is the moral and patriotic duty of the leaders of this truly distinctive American industry.

Kahle Elected President of Beacon Oil

NEW YORK, Feb. 12.—Richard B. Kahle, president of the Louisiana Oil Refining Co., has been elected president of the Beacon Oil Co. in which company the Louisiana corporation has acquired a substanial interest through purchase of part of the holdings of the Massachusetts Gas Cos. Mr. Kahle succeeds H. L. Wollenberg. Clifford M. Leonard has succeeded J. L. Richards as chairman of the board.

Common stockholders of the Louisiana company have until Feb. 16 to subscribe to the new 6 per cent cumulative convertible preferred stock of the Louisiana company. Rights to subscribe are at the rate of 0.035 of a share of preferred for each common share held; otherwise 3½ shares of preferred for each 100 common shares held. Subscriptions are to be for cash and at par.

Cincinnati Oil Man Dies

CINCINNATI, O., Feb. 12.—Harry W. Bachelor, vice president of the Cincinnati Vulcan Co. for the past four years, died at the age of 48 years recently at his home at Hartwell, O.

Mr. Bachelor had been a prominent oil man in Cincinnati for many years, and had been for 27 years as salesman with the Pure Oil Co. and the Moore Oil Co., previous to his connection with the Cincinnati Vulcan Co. He was a member of the Masonic order belonging to the N. C. Harmony Lodge, the Shrine and the Scottish Rite. He was also active in the Knights of Pythias and the Elks lodges.

Mr. Bachelor was born in Lockland, O., but lived most of his life in Hartwell. He is survived by his widow, Mrs. Alice Lightner Bachelor; a brother, George R. Bachelor, and a sister, Mrs. Fred Shepard.

Technical Men to Address Western Refiners

TULSA, Feb. 13.—The technical program which is to occupy the attention of the Western Petroleum Refiners Association on the second day of its annual convention at Fort Worth, is rapidly being worked out under the direction of C. L. Henderson, chairman of the manufacturing committee. Names and subjects of a number of speakers were announced Feb. 8 by Howard Bennette, managing director.

Dr. A. P. Bjerregaard, petroleum technologist for the Empire Refineries, will read a paper on "Specifications of Petroleum Products." Edward P. Bailey, president of the American Oil Burner Association, will speak on "What Domestic and Industrial Oil Burning Mean to the Refiner."

"Contributing Factors to Corrosion" will be the title of a paper presented by Dr. C. K. Francis, consulting petroleum technologist. Ludwig Schmidt of the U. S. Bureau of Mines will discuss "Evaporation Losses at Refineries."

"Insulation of Refinery Equipment," will be discussed by L. E. Cover, Armstrong Cork and Insulation Co. Isaiah Hale, safety engineer for the Santa Fe railroad, will be a speaker.

R. R. Irwin, vice-president, White Eagle Oil & Refining Co., will preside at the group meeting of traffic managers which will be held March 2, the opening day of the convention. The docket for this meeting includes a discussion by Fayette B. Dow, Washington counsel for the Association, on Docket 17,000 of the I.C.C. Other subjects to be discussed will include settlement of tank car mileage, car repair bills, state tank car taxes, and pending rate cases.

The refiners' convention will continue through March 3 and 4.

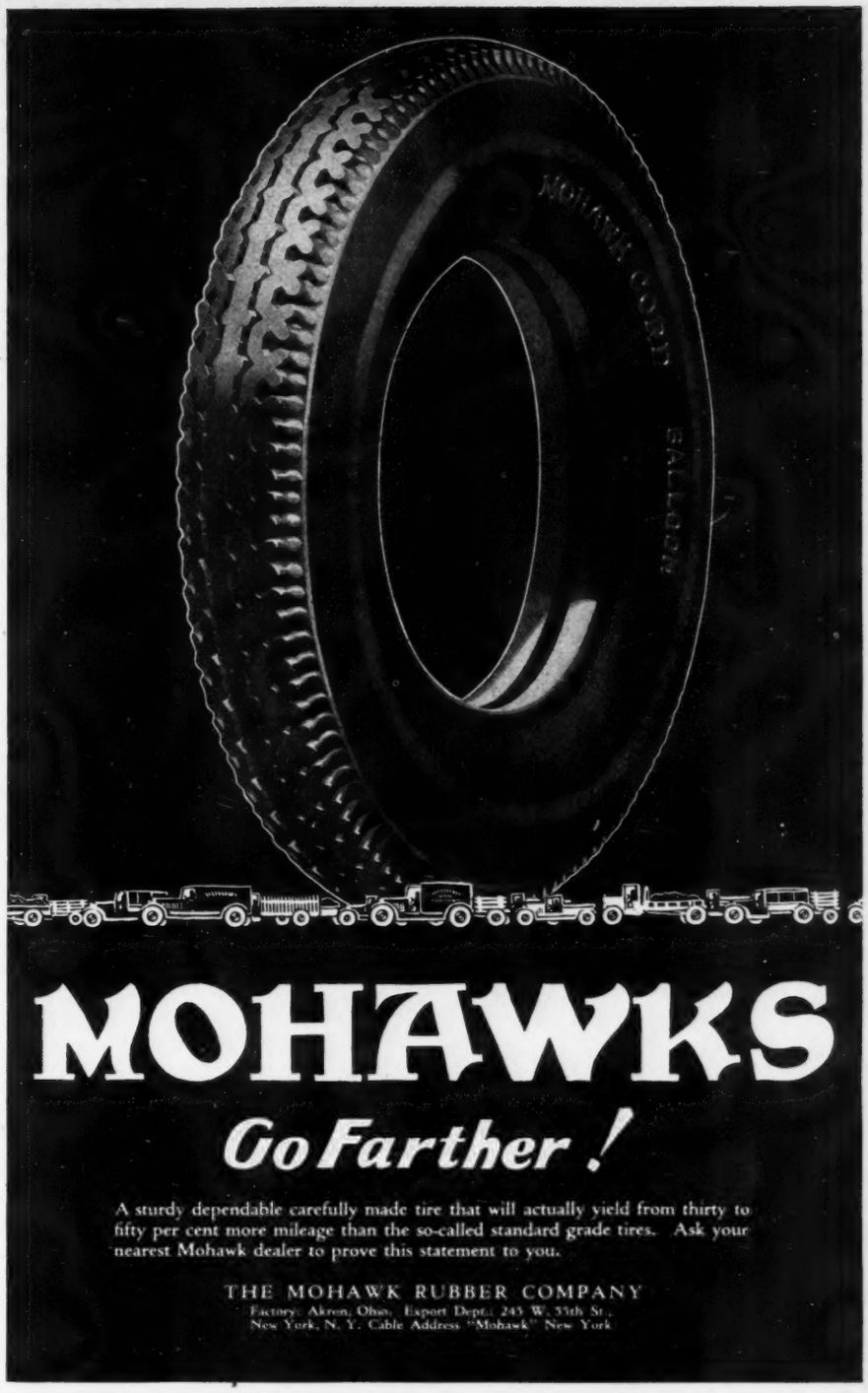
Hanlon to Run Part of Gas Holdings of Texas Co.

TULSA, OKLA., Feb. 13.—The Hanlon Gasoline Co., one of the Chestnut & Smith affiliated interests, has concluded an operating arrangement with The Texas Co., covering the Texas Co.'s entire natural gas holdings in the Breckenridge district, according to announcement at the Chestnut & Smith offices here.

While the deal does not involve the sale of The Texas Co.'s gasoline plant at Parks, Tex., it gives the Hanlon Gasoline Co. a much broader development play in this prolific territory.

The Texas Co. reserves rights with respect to residue gas, it is reported, and the Hanlon company has concluded the sale of a large quantity of natural gasoline to The Texas Co., to be delivered over a long period.

COLUMBIA, S. C.—Evans Motor Co., Inc., has just installed a new type Alemite air pressure lubricating compressor which will give a pressure of 2250 pounds, reports James M. Evans, secretary and treasurer.



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Co-Operation is the Greatest Builder

On the summit of the only hill in Paris, Montmartre, there is a church whose vivid white domes rise high above the ancient houses crowding up to its very feet. Wherever you wander in Paris you can see this church, the Sacré Coeur, shining and white above the mist like a fairy castle.

It has been built since the war as a thank offering for victory, and every French province, city and community has contributed some one thing, large or small.

Such co-operation builds great businesses as well as great churches. The James B. Berry's Sons Company knows this and knows that co-operation within our organization accounts for our standard of efficiency and integrity in dealing with our customers.

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PETROLEUM PRODUCTS

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Philadelphia Tulsa London, Eng. Hamburg, Germany Paris, France

HERE & THERE

National Petroleum News

Samuel Messer, president of the Quaker State Oil Refining Co., Oil City, Pa., and G. B. Hunter, secretary, recently visited San Antonio, Tex. They were met by J. M. Koch and George W. Miller, southwestern representative for the company; also by Henry T. Matthews, of San Antonio, William Koch, of Dallas, W. H. Newton, Fort Worth and Lynn Adams, Waco, Tex., all of whom are distributors of Quaker State oil and greases in their respective cities.

* * *

Norris Farnell, agent at Lake City, Fla. for the Standard Oil Co. of Kentucky, will enter the oil business for himself about April 1. Mr. Farnell, with M. B. Cochrane, will operate three drive-in service stations at that point under the name of the Sunshine Service Stations, handling Standard Oil Co. products exclusively and a line of automobile accessories.

* * *

Lowell F. Lindley, who for the past 12 years has been distributor of asphalts for the Gulf Refining Co. in Chicago territory, is now an independent broker in asphaltums and heavy oils, specializing in products of the New Orleans Refining Co., New Orleans. Mr. Lindley's headquarters are in the Marquette Bldg., Chicago.

* * *

S. M. Stevens, Tulsa, Okla., familiarly known as "Steve himself" in the Mid-Continent oil fields, who has been sales engineer for the past nine years for Johns-Manville, Inc., Tulsa, is now in the same capacity with R. V. Aycock Co. Mr. Stevens was for 14 years with Johns-Manville company.

* * *

E. W. Docker, vice president of the Guarantee Oil Corp., Detroit, Mich., distributor of Marland Refining Co.'s products in that territory, reports the closing of a very satisfactory year. The company handles Marland's Red Triangle gasoline and super motor oils.

* * *

C. W. Gish has left the Spencer Petroleum Co., Chicago, and is now representing the Kanotex Refining Co. in Nebraska, reports John M. McE. Ames, president. The company's headquarters are at Arkansas City, Kan.

* * *

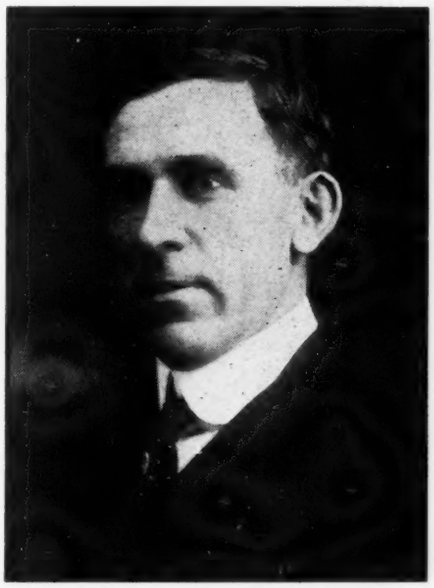
C. C. Brown, president of the Kay County Gas Co., Ponca City, Okla., has just returned to Ponca City from an extended trip of inspection through Texas, New Mexico and California.

* * *

R. K. Shoolroy, president of The Arrow Oil Co., Wooster, O., is spending a few weeks at Mt. Clemens, Mich.

C. E. Brown, manager at New Castle, Ind., for the Indian Refining Co., Lawrenceville, Ill., has moved his family to New Castle from Anderson, Ind., where he was formerly salesman for the Standard Oil Co. of Indiana, Chicago.

* * *



John W. Ferguson, recently appointed assistant general manager of the central distributing division of the Pure Oil Co., Columbus, O. Mr. Ferguson has the record of being 18 years on the one job as manager of the Columbus bulk plant of The Moore Oil Refining Co., and its successor, the Pure Oil Co.

* * *

E. P. Bernardi, salesman for the past five years in Detroit territory for the Sinclair Refining Co., Chicago, has severed his connection with that company and is now salesman for the Guarantee Oil Corp.

* * *

Frank S. Cohen, treasurer of the Wilson Oil Corp., New York, recently sailed on the S. S. Leviathan for Cherbourg, whither he will go to Egypt, Syria and Palestine where the Wilson company has agencies.

* * *

E. M. Cassel, formerly vice-president of the Seymour-Howard Corp., of Chicago, is now head of the Petroleum Products Corp., Milwaukee, Wis., which manufactures what it terms a universal grease system.

* * *

Benjamin Sobol, of Sobol Bros., oil jobbers at New York City, is spending the winter in California.

William D. Bloodgood, vice president and treasurer of The North Central Texas Oil Co., Inc., New York City, is now visiting the Shreveport, La. offices of his company and looking over the company's properties in Louisiana and Arkansas.

After that, he will go to Panama and Havana via steamer from New Orleans, reports H. A. McGuirk, secretary to Mr. Bloodgood. Mrs. Bloodgood is accompanying Mr. Bloodgood.

* * *

Basil Turner, librarian of the Marland Oil Co., Ponca City, Okla., recently returned from a trip visiting technical libraries at Stillwater, Tulsa and Oklahoma City, Okla., and also the Oklahoma University at Norman. Mr. Turner is looking for another assistant librarian. The Marland library is to be re-catalogued, and a system will be adopted which will permit rapid growth of the technical section.

* * *

H. F. Smith, formerly at Pernell, Okla. with the Texas-Pacific Coal & Oil Co., is now general superintendent of the Homestake Exploration Corp., Sunburst, Mont., which operates in the Kevin-Sunburst field. This company was recently purchased by the Texas Pacific company.

* * *

H. C. O. Clarke, who has been in charge of the petroleum engineering department for the past two years at Mexia for the Pure Oil Co., Columbus, O., has been transferred to Columbus in the same capacity. Mr. Clarke was formerly with the U. S. Geological Survey.

* * *

W. Hunter Atha, president of the Atha Drilling Co., Zanesville, O., accompanied by Mrs. Atha, is enjoying an extended trip through the south. Mr. Atha is a well-known operator in the oil and gas fields of southeastern Ohio.

* * *

Munson Burton, vice-president and general sales manager of Swan-Finch Oil Corp., New York, attended the recent convention of the American Petroleum Institute at Los Angeles, reports E. V. Moncrieff, secretary.

* * *

Ira L. Neely, general manager of the Empire Gas & Fuel Co., Wooster, O., was a visitor at the general offices of Henry L. Doherty & Co., at New York recently.

* * *

William J. Rule, Jr., salesman for the Crown Central Petroleum Corp., New York City, is now making his headquarters at Decatur, Ga., a suburb of

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There is a uniformity of manufacture that is standard, too. Defiance Barrels are *all* good barrels. Every barrel in a shipment can be depended on.

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A. D. MILLER SONS CO. *Pittsburgh, Pa.*

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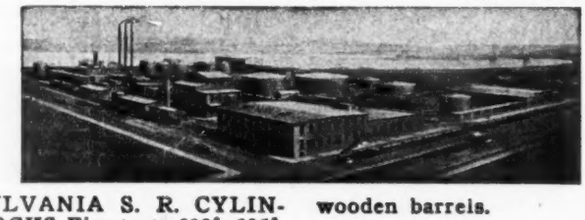

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PENNSYLVANIA MOTOR OILS, Blended to suit Jobbers' specifications. In tank cars, steel drums, wooden barrels.

VISCOUS PALE NEUTRAL OILS, KEYSTONE PAINTERS' SPIRITS. All grades WATER WHITE OILS, MINERAL COLZA, GASOLINES, etc.

Cable Codes: Western Union (Universal) ABC (4th and 5th Edition, Private Codes) Established 1862

Atlanta. "Bill," as he is familiarly known, has covered the jobbing trade along the Atlantic coast from Boston to New Orleans, having formerly been with the Union Petroleum Co. and later with the Sinclair Refining Co.

* * *

R. H. McElroy, director of traffic for the Standard Oil Co. of Indiana, Chicago, has been appointed traffic manager of the Dixie Oil Co., Chicago, a subsidiary of the Standard, and E. J. Bullock, director of purchases for the Standard, has been made director of purchases for the Dixie company, according to George M. Cook, manager of public relations for the Standard.

* * *

Foxhall A. Parker, formerly salesman at the Washington, D. C. branch of the American Oil Co., Baltimore, has been promoted to branch manager at its Lancaster, Pa. branch.

J. W. Middleton is now assistant manager of the Washington plant, which will be good news to the many friends of "Capt. Jack," according to Lee Sonneborn, manager at Washington.

* * *

A. Wolff, chairman of the board of directors of the Puritan Oil Corp., St. Louis, Mo., was seriously injured recently when the automobile in which he was riding was struck by a train. Mr. Wolff sustained a fractured leg and his companion, Sam Cohen, was instantly killed. Mr. Wolff is improving and an early recovery is expected by his many friends.

* * *

George W. Miller, southwestern representative at Fort Worth, Tex. for Quaker State Oil & Refining Co., Oil City, Pa., recently spent two weeks in San Antonio and opened up 20 new accounts despite the snow storm there which left six inches of snow on the ground. Mr. Miller reports the business outlook good.

* * *

Clifford H. Cheeseman is now manager of service stations for the Muskogee Oil Co., Columbus, Ga., and he reports business increasing.

T. E. Berry, president, reports that the company plans to install storage at one of its stations.

* * *

Lafe S. Collins, president of the S. L. Collins Oil Co., Knoxville, Ia., has been suffering from a broken left arm and dislocation of the elbow. This misfortune occurred late in November when his automobile skidded into a ditch.

* * *

George Ball, has resigned as sales manager for the Standard Oil Co. of Indiana at Plainfield, Ill., and started his own oil business, the Unit Service Station System. He is operating several service stations.

* * *

D. J. L. Davis, general manager of the N-T-U Co., New York, is on an extensive trip through the West, visiting the company's plants and properties, reports H. M. Hill, assistant to the general manager.

Industrial Notes

The Widdell Engineering Co., Kansas City, Mo., consulting engineers and general contractors, and Arthur G. McKee & Co., Cleveland, O., contracting engineers, have formed an association for oil refinery engineering and contracting. including design and construction of refinery equipment, pipe stills, fractionating towers, treating plants, etc.

The Widdell company is successor to the Cross-Widdell Engineering Co., well known in refining circles. The McKee company for the past 20 years has specialized in the construction of blast furnaces, steel plants, rolling mills and in design and construction of equipment for iron and steel manufacture.

The Widdell company will maintain its offices at Kansas City, with branch office at Tulsa. The McKee company remains in Cleveland.

* * *

The John S. King Co., Inc., Cleveland, O., advertising agency, at its annual meeting and election of officers held recently, elected John S. King, president; C. A. Brinkman, first vice president; K. L. Ede, second vice president; John E. Wiley, secretary; and Edward King, treasurer.

The company recently moved into the newly-completed Carnegie Hall on Huron Road, Cleveland.

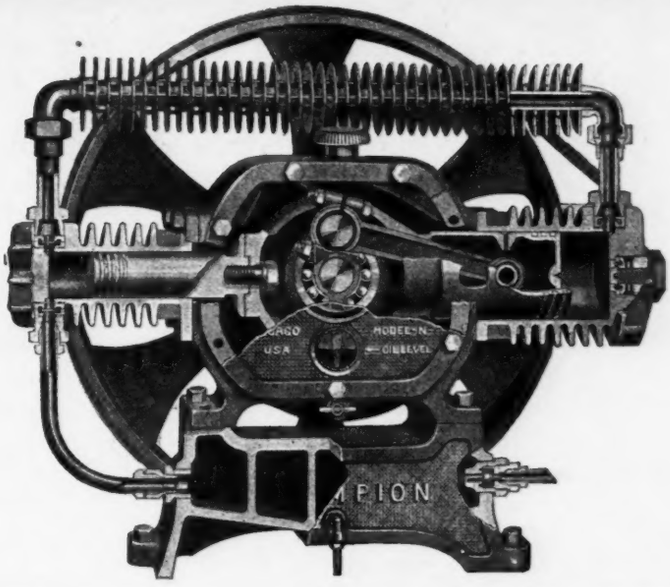
Industrial Catalogues

Metallo Gasket Co., New Brunswick, N. J.—Catalog 26 has just been published, covering the company's line of various types of gaskets for various uses. Gaskets for use in refineries are included, with sizes and price lists. Recommendations of the gasket best adapted to the service required are included for gas, gasoline, oil, salt water and steam.

* * *

Butler Mfg. Co., Kansas City, Mo.—A leaflet describing the Butler visible pump is off the press, describing its three models, hand-operated, air operated and combination hand and air. The construction, specifications and operation of the pump are given and the pump is described by the company as attractive and low in price.

ST. LOUIS, MO.—Paul V. Browne, president of the Independent Oil Co., St. Louis, is distributing Red Hat gasoline here and Anderson-Prichard Co.'s naphthas. The company has a total storage capacity of 350,000 gallons, 250,000 gallons of which is underground.



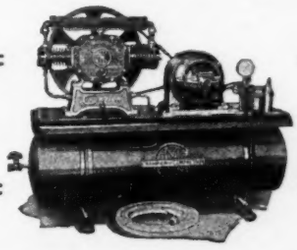
CHAMPION Air Compressors

Here is the newly improved unit of the new N-13 Model Champion Air Compressor, well worth your while investigating. Annular Ball Main bearings on the main bearings of the crankshaft, make for smooth and more silent operation—there are no frictional losses, saves power and cuts cost of maintenance.

Write for

Our bulletin full of facts and data sent upon request.

Single Stage



Two Stage

Champion Pneumatic Machinery Co.
8168 South Chicago Ave. Chicago, U. S. A.

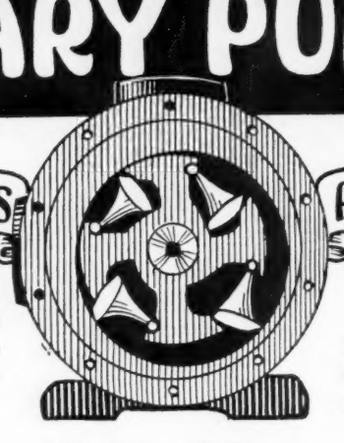
THE GEOLOGY OF PETROLEUM

is the name of the book written by William H. Emmons, which goes into detail describing the more important fields such as the Appalachian, Lima-Indiana, Illinois, Mid-Continent, Gulf Coast of Texas and Louisiana, Rocky Mountain, Canadian, Mexican and foreign fields.

It contains 610 pages, with 254 maps and illustrations, and may be purchased for $6 from—

National Petroleum News
824 Caxton Building Cleveland, Ohio

BLACKMER
ROTARY PUMPS



Dominates the field in transferring oil and gasoline.

Capacities from 3 G. P. M. to 500 G. P. M. hand or power operated.

District Offices

284 Peachtree St., Atlanta, Ga.
709 Title Bldg., Baltimore, Md.
428 Old South Bldg., Boston, Mass.
52 W. Chippewa St., Buffalo, N. Y.
608 So. Dearborn St., Chicago, Ill.
1347 Book Bldg., Detroit, Mich.
408 Austin St., Houston, Texas.
4025 Boulevard Place, Indianapolis, Ind.
1505 Commerce Bldg., Kansas City, Mo.
1320 Starks Bldg., Louisville, Ky.
429 Broadway, Milwaukee, Wis.
549 Plymouth Bldg., Minneapolis, Minn.
306 Wells Fargo Bldg., New Orleans, La.
71 Murray St., New York, N. Y.
904 Real Estate Trust Bldg., Philadelphia, Pa.
711 Ferguson Bldg., Pittsburgh, Pa.
1516 Pine St., St. Louis, Mo.
693 Mission St., San Francisco, Calif.

BLACKMER ROTARY PUMP CO.
GRAND RAPIDS (FORMERLY PETOSKEY) MICH.

BETHLEHEM
WAX PLANT EQUIPMENT

Filter Presses — *Wax Moulding Presses*
Wax Distillate Chilling Machines — *Scale Wax Cooling Drums*
Wax Testing Presses — *Paraffine Wax Sweater Plants*
Complete Wax Plants designed and built
Pumps, Stills, Towers, Condensers and other Oil Refinery Equipment
Oil Burning Systems — *Complete Power Plant Equipment*

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
BETHLEHEM, PA.
GENERAL SALES OFFICES: 25 BROADWAY, NEW YORK CITY

Survey Shows Most Kansas Jobbers Are Novices

CHICAGO, Feb. 13.—An interesting experiment was made last week in Salina, Kan., showing what a large portion of oil jobbers have come into the industry in the last few years. It was on Jan. 29 when more than 100 oil jobbers assembled for the regular meeting of the Central Kansas Oil Men's Club. The survey was made by Lacy Rosier, Rosier Oil Co., Hutchinson, in the course of his talk before the gathering.

Mr. Rosier asked all the men present who were engaged in the oil business one way or another in 1905 (20 years ago) to rise. Three stood up. Then he asked those who were in the business in 1910 to stand. Five more took the floor. Mr. Rosier repeated his question substituting 1915 and 1920 and still not half the jobbers in the room were standing. Finally he asked those men to be seated and all to rise who had come into the business since 1920. The greater part of the men in the room stood.

"Now that," said Mr. Rosier, "is what is the matter with us. You men have been learning the oil business at a frightful expense to yourselves and to the industry."

Ford Wright, an oil jobber who operates under his own name in Wichita, carried the idea a little further. "How many present keep a record to show from day to day whether you are making or losing money?" Mr. Wright inquired. According to the report from H. G. James, secretary of the American Oil Men's Association, who was present, only 5 per cent of the men stood up.

Mr. James was on the program. He introduced his remarks with a motto which he found on the blackboard in the room when the oil men began to assemble. The motto was "The devil was in heaven until he started to be a knocker." Beginning there, he deflected his remarks quickly to the Biblical account of the conversion of Saul and Tarsus and preached an ethical sermon from the Scriptures. Incidentally — Horace G. James was once state president of the B. Y. P. U. in California, so he has not entirely forgotten how to exhort.

Upon his return to Chicago, Mr. James reported that John A. Motter, secretary of the Kansas Oil Men's Association, had developed a remarkably fine program for the regional meeting. One of the best numbers on the program was a practical discussion of lubricating oil by Dan F. Reusser, Farmers' Oil Co., Moundridge, Kan. Mr. Reusser talked in elementary terms, telling just how such tests as viscosity, flash and fire should be made.

AURORA, MO.—Ozark Oil Co. has recently completed drive-in service stations here and at Marionville, Mo., reports T. A. Burney, manager.

New Oil Station Construction

Columbia, Mo.—The Columbia Oil Co. is erecting service station to be opened about April 1. This town has 15,000 inhabitants and 10 oil companies buying gasoline in tank car lots, according to Charles E. Proctor, manager.

* * *

Waco, Tex.—Lynn Adams, distributor of Quaker State oils and greases, is building warehouse here to handle increasing business.

Purchases Site for $100,000

ST. LOUIS, MO.—The Lubrite Refining Co. has purchased corner property here, for which it is said to have paid $100,000. It has a frontage of 100 feet on Washington Ave. and 135 feet on 19th St. At present the company has a filling station on this property but it will be torn down and a new filling station, plus complete greasing and oiling facilities, will be erected.

Louisville, Ky.—Stoll Oil Refining Co. will build two additional service stations in Cincinnati, O. as soon as weather is favorable.

* * *

Benton Harbor, Mich.—Mrs. Emma Cole will build filling station at Pipestone and Agard Sts.

* * *

Harvard, Ill.—Frank R. Goodall purchased property at Sharon, Wis., for filling station.

* * *

Hannibal, Mo.—Standard Oil Co. of Indiana, Chicago, will build service station here.

* * *

Joplin, Mo.—Joplin Oil Co. is building two service stations on the outskirts of Joplin.

* * *

Omaha, Neb.—Frank Panebianco and E. H. Blakely to build filling station.

* * *

Martins Ferry, O.—G. C. Travis, of Brookside, plans erecting service station.

* * *

Sioux Falls, S. D.—Brownell Corp. applies for permit to build filling station.

WOOSTER, O.—Ohio Public Service Co. is completing a three 160 h.p. unit compressor station in Columbia township, Lorain county. A new pool of Clinton sand gas is being developed in this township.

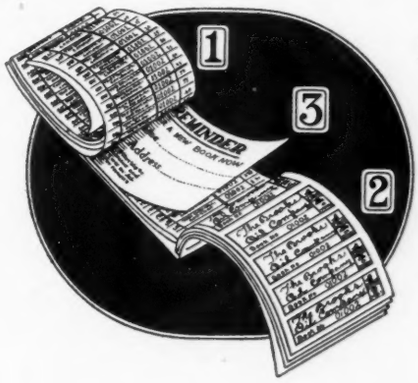
We are printing money when we print coupon books for you

Rand McNally & Company use the same care in printing your coupon books that the United States Government takes in printing money.

These books *are* money and you must be adequately protected in every one you put out.

If your books are made by Rand McNally & Company, they are printed in a locked department where only trusted employees actively on the job are allowed. There are four separate checkings during manufacture to assure that the amount of coupons is the same as the money value of the books and that all numbers are correct.

You need these safeguards as well as the other superior advantages of Rand McNally coupon books, made either in the improved Strip-Style or the Patented Self-Indicating to meet your individual needs. Ask for details and prices.



Improved Strip-Style Books have:

1—Vertical quick-cancelling perforation
2—One-cent coupons which, with five or ten cent strips, make exact change
3—Reminder to customer to order another book

RAND McNALLY & COMPANY
Dept. B-26
536 S. Clark Street, Chicago 270 Madison Avenue, New York
Washington San Francisco Los Angeles

Used Oil Equipment

If you want to buy it—turn to the classified advertising page at the back of this issue. If what you want is not listed there, why not insert an advertisement of your own next week?

If you want to sell it—follow the same course.

There is a constant market in used oil equipment. Take advantage of the great savings possible, either by selling what you no longer need or buying what you do need.

National Petroleum News
892 Caxton Building **Cleveland, Ohio**

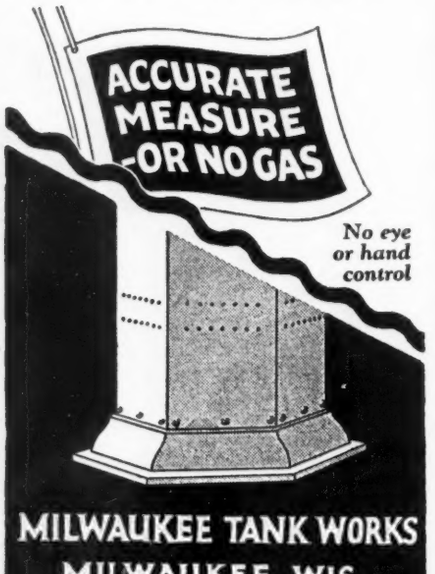
A pump that will serve gas only when the sliding tube is correctly set for accurate measure is strictly

"Compulsory-Accurate"

The Milwaukee Visible is the only pump that will not serve a drop of gas until set for accurate measure.

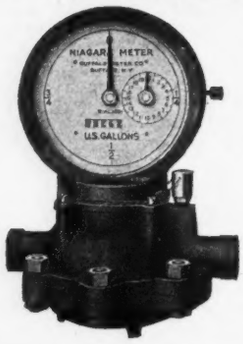
Write for plan that guarantees increased gallonage.

That is the true meaning of



MILWAUKEE TANK WORKS
MILWAUKEE, WIS.

NIAGARA GASOLINE METERS



have proved their superiority to many service station owners. They meet every requirement of accuracy, speed, dependability and low cost. Let us show you how you can use them to advantage. Our catalog gives all the details.

BUFFALO METER CO.
2889 Main St. Buffalo, N. Y.

GULF Refining Company

General Sales Offices
PITTSBURGH, PA.
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New York, Houston, Atlanta, Boston, New Orleans, Tampa, Philadelphia

REFINERS OF OKLAHOMA TEXAS AND LOUISIANA

PETROLEUM

REFINED OIL
GASOLINE
NAPHTHA
GAS OILS
PARAFFINE WAX
ASPHALT

Fuel Oil--Lubricating Oils

CYLINDER ENGINE
CORDAGE

RED AND PALE PARAFFINE OILS

ON THE LAZY BENCH

National Petroleum News

No Duns for Bill

Herb Graffis in conversation with Bill Brown, manager of the Iowa Oil Company.

Herb—"So you are the father of seven children. By gosh, Bill, I'll say you deserve a lot of credit for having such a wonderful family."

Bill—"Yes, I guess you're right, but I usually pay cash."

—The Unloading Rack

NOT TO BE "DONE"

"My dear young lady," said a gushing artist, "you are positively lovely! Wouldn't you like me to do you in oils?"

"Sir," exclaimed her father's pride indignantly, "do you take me for a sardine?"

—Edinburgh Weekly Scotchman

Taking Stock

John McDonald (to foreman in the machine shop)—"How many oil pumps have you on hand?"

Foreman—"I couldn't tell you off-hand, sir."

John McDonald—"Dammit, who cares about off-hand, I said on hand."

—The Unloading Rack

Stupid

Suitor—"I called to-er-talk-er-to you about-er-your daughter's hand."

Father—"James! Tell Miss Helen the manicurist has arrived.

—The Passing Show (London).

Different

She—"Once you called me the light of your life."

He—"Yes, but you go out too much now."

"How was the Barber's Ball last night?"

"Well, I stayed until a fellow committed herpicide, and then I decided the party was getting too dandruff."

Restoration

Traffic Cop halting a speeding motorist.

Traffic Cop—"Say, what's the idea of paying no attention when I whistle for you to stop?"

The Speedy One—"I'm sorry, sir, but I am deaf."

Traffic Cop—"Well, we'll see that you get your hearing in the morning."

—The Unloading Rack

Soft Stuff

Rolly—"She likes to be flattered, doesn't she?"

Polly—"Yes. Once I told her she was as sweet as honey, and the very next day she had the hives."

—La Esfera (Spain).

Johnny Knows

Little Johnny—"So you're my uncle, are you?"

Old Gentleman—"Yes, my boy—on your father's side."

Little Johnny—"Well you're on the wrong side—you'll find that out."

—The Unloading Rack

HE WAS BOSS

"What! You fell down the stairs? Why, how did it happen?"

"Well, you see, I started to go down, and my wife said, 'Be careful, George.' And I'm not the man to be dictated to by any woman, so down I went."

—London Life

'S Terrible!

Telephone Operator (to another T. O.)—This is awful. All the wrong numbers are busy, so I'll have to give this party what he asked for.

—Flash Points

"Johnny has just eaten eleven plums!"

"Good Lord! Call the plumber!"

A REAL VALUE

Complete Net only $7.50

L-U-C-E 302K Folio is made of heavy, double weight muleskin, with reinforced bottom and strong lock, handle and straps. The edges are turned and lock stitched. One of the 3 roomy pockets contains an inner Case which holds 6 four oz. bottles and 5 grease jars. It is covered with washable Keratol and lined with velvet. Your name embossed in gold *free*. Satisfaction *guaranteed*.

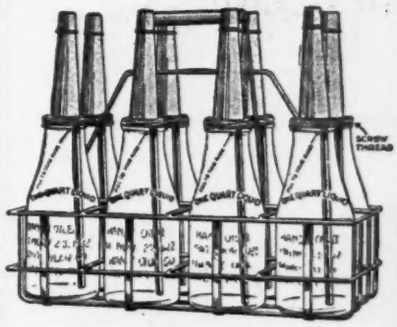
Other Styles in our FREE Catalog

L-U-C-E

Builders of Sales Luggage

614 Delaware KANSAS CITY, Mo.

The Handy Oiler



THE public today demands that you give them quick, clean service. This you can do by dispensing your lubricating oils with Handy Oilers, and improve the most valuable asset to your business, "Service".

Handy Oilers are marked to pass the inspection of the Division of Weights and Measures in each state where sold.

These prices are subject to the regular discounts.

LIST PRICES

Complete Outfit	$10.00
Handy Oiler Container and Spout	1.00
Basket	2.50
Metal Spout and Breather Pipe	.60
Glass Container Only	.45
Gasket	.05
Dust Cap	.10

Manufactured by

Handy Oiler Co.

Danville, Indiana

Purchase from your jobber if possible. If he will not supply you, we will ship direct.

THE LOCATION of dealers who feature Sinclair Oils makes no difference in the closeness of the contact between us—a contact closer than is usual between buyer and seller.

Sinclair dealers are never without Sinclair service and co-operation. Sinclair recognizes and fulfills its obligations to the dealer.

SINCLAIR REFINING COMPANY

NEW YORK
Sinclair Oil Bldg., 45 Nassau St.
Telephone: Rector 9320

CHICAGO
22nd and Rockwell Streets
Telephone: Crawford 2000

Cable Address: "Lucent"

SINCLAIR OILS

Refinery - Tank Wagon Markets

National Petroleum News

Kerosene Approaching Seven Cent Level In Mid-Continent Field

Staff Special

TULSA, Feb. 16

KEROSENE at 7 cents and over per gallon, f.o.b. Mid-Continent refineries is almost a certainty before the end of next week, if the material continues its present pace upward. It has been steadily tightening while straight-run gasolines were having a hard struggle to hold the positions into which they were shoved following crude advances the first of the month. The 41-43 water white grade was poised just under the 7-cent figure as the week closed, and 42-44 w. w. kerosene was a jump ahead and still tighter.

Kerosenes and natural gasolines get the honors for creating the only signs of activity in the Mid-Continent area the past week. Naturals came in for a buying flurry the first half, but with the slackening of demand Thursday and Friday, prices had sagged somewhat by the close of business today.

The continued tightening and scarcity of kerosenes, however, is furnishing one of the main topics of discussion at present. And the prospects are the topic will continue to be a live one for some time, since there is nothing on the horizon which would indicate the commodity will become freer in the near future.

As more cracking units are installed by Mid-Continent refiners, the percentage of kerosene produced naturally will continue to decrease. Many refiners already have stopped making a kerosene "cut," turning the heavier oils directly into the cracking units.

No Kerosene Cut

One Oklahoma refiner said this week that his plant is not being operated with the idea of producing any kerosene at all, but that a small percentage was turned out regardless.

"The material is really a rotten product," he admitted. "But we have a good many gasoline customers who would have difficulty getting kerosene, and we try to take care of them the best we can. Our entire kerosene output is only 2 per cent of the total production of our skimming plant."

His situation explains in part that of several other refiners. They continue to produce kerosene to take care of a few of their good gasoline accounts, but have very little material for outside offering and then only at rare intervals.

Another refiner predicts that kerosene eventually will occupy a place just under naphtha, similar to the position naphtha now holds to U. S. Motor gasoline. He bases his prediction primarily on the continued installation of cracking units, improvement in fractionation and the resultant decrease in kerosene "cuts."

A study of kerosene prices over 1925 as compared with U. S. Motor gasoline prices over the same year lends considerable weight to his prediction.

The lowest price at which 41-43 w. w. kerosene was sold in Oklahoma in 1925 was 3⅞ cents. The highest price was 5¼ cents, this price being reached in December. The average price for 1925 was 4.55 cents per gallon.

In 1925 the average price for U. S. Motor gasoline in Oklahoma was 10.65 cents per gallon. By comparing these two average prices the average price of kerosene on the spot market last year was 42.8 per cent of the average price of U. S. Motor gasoline. The present spot market of kerosene is 65.3 per cent of the spot market price of U. S. Motor gasoline.

Sluggishness of Demand

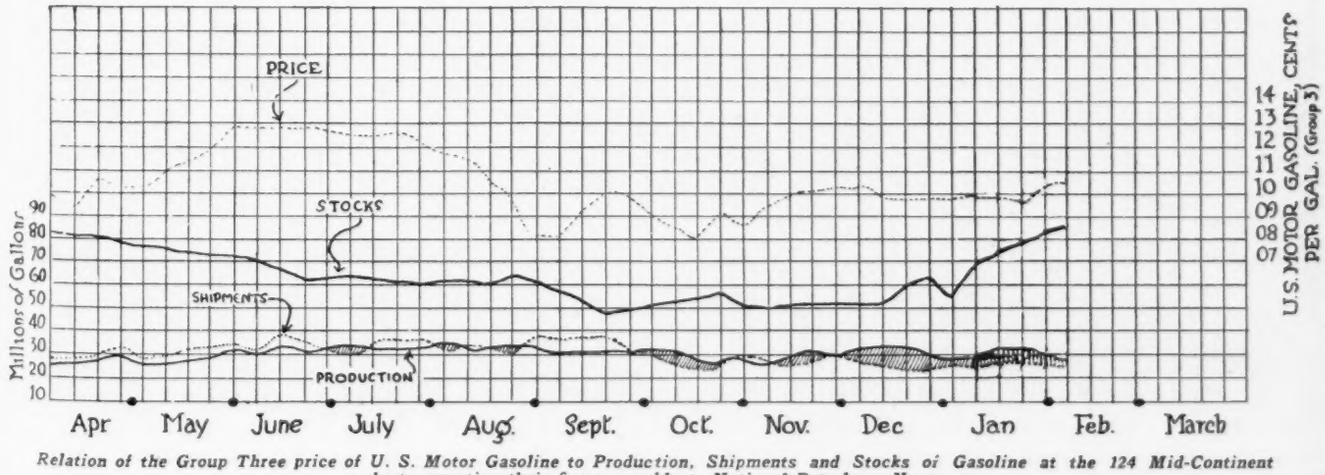
The sluggishness of the straight-run gasoline demand, meanwhile is all that is disturbing the refiners at present. As far as the stocks are concerned, the refiners are in a good position. According to reports to National Petroleum News from 124 refiners in the Mid-Continent field, for the week ending February 5, around 23 days' supply of gasoline was on hand. This is not a big figure for this time of year, although somewhat larger than at the same period in 1925.

The same reports showed that refiners cut their crude runs approximately 18,000 barrels a day during the week. Whereas around 4,000,000 gallons of gasoline were being put into storage each week in January, there were less than 2,000,000 gallons run to storage the first week of this month.

If refiners continue to cut their crude runs the prospects of the dreaded lull before the spring and summer activity

(Continued on page 117)

Barometer of the Mid-Continent Gasoline Market



Relation of the Group Three price of U. S. Motor Gasoline to Production, Shipments and Stocks of Gasoline at the 124 Mid-Continent plants reporting their figures weekly to National Petroleum News.

STASO

ALL WEATHER TRANSMISSION LUBRICANT

STASO PRODUCTS

STASO, made from a specially selected grade of refined crude as the base, represents the last word in a lubricant specifically compounded to eliminate the wear and resistance of transmission gear friction. It flows at zero temperatures and it maintains its body and lubricating qualities in hot weather.

STASO is a year-around product with a continuous sales-building quality. Its remarkable performance quickly spreads throughout a community because no other lubricant on the market approaches it in satisfaction to car owners. *And it costs no more than ordinary lubricants.*

STASO gives jobbers a big "edge" on competition.

Couple up the super-quality of STASO with the facts of a big Chicago barreling plant, which guarantees prompt delivery in tank cars, carloads, drums, half-drums, 15, 10 or 5 gal. lots, plus the dependability of an old-established organization and you have a service combination which cannot fail to make money for you.

Why not investigate this remarkable product?
Write for full information.

Keystone Oil & Manufacturing Division
Central Commercial Company
332 South Michigan Ave.
Chicago

Refinery Markets on Light Oils and Lubricants

Pennsylvania, Oklahoma, North and South Texas, Louisiana, Arkansas, California

GASOLINE AND NAPHTHA

PENNSYLVANIA	Prices Feb. 15	Prices Feb. 8	Prices Feb. 1
52-54 Naphtha	11¾-12	11½-11¾	11¼-11½
54-56 Naphtha	12¼-12½	11¾-12	11½-12
58-60 Gasoline	12¾-13	12½-12¾	12 -12½
60-62 Straight-run gasoline	13¾-14	13½-13¾	13 -13½
62-64 Straight-run gasoline	-14½	-14¾	-14
64-66 Straight-run gasoline	14¾-15¼	14¾-15	14½-15
68-70 Straight-run gas. 350-360 E.P.	15¾-16¼	15¾-16	-16
68-70 Straight-run gas. 305-320 E.P.	-20	-20	-19
70-72 Straight-run gas. 300-305 E.P.	-21	-21	-20
OKLAHOMA			
48-50 450 E. P. naphtha	9½- 9¾	- 9¾	9¾-10¼
50-52 450 E. P. naphtha	- 9¾	9¾-10	9¾-10¼
56-58 450 E. P. gasoline	-10	10¼-10½	-10¾
56-58 U. S. Motor gasoline	10 -10¼	10¼-10½	10¼-10½
58-60 U. S. Motor 437 E. P.	10¼-10¾	10¼-10¾	10¼-10¾
60-62 400 E. P. gasoline	11¾-12¼	-12¼	-12¾
64-66 390 E. P. gasoline	12¼-12½	-13	.....
64-66 375 E. P. gasoline	12½-13	13 -13¼	13¼-13½
68-70 350-360 E. P. gasoline	13½-13¾	13¾-14	14 -14¼
64-66 437 E. P. blend	-10½	10½-10¾	10¾-11
KANSAS*			
58-60 U. S. Motor gasoline	-11	11 -11¼	-11
60-62 400 E. P. gasoline	12¾-13	-12½	-12¾
64-66 375 E. P. gasoline	13 -13½	13½-13¾	14 -14½
NORTH TEXAS			
48-52 450 E. P. naphtha	9¼- 9½	9¼- 9½	- 9¾
56-58 450 E. P. gasoline	9¼- 9¾	- 9¾	9½- 9¾
58-60 450 E. P. gasoline	9¾-10	-10	9¾- 9¾
56-58 U. S. Motor gasoline	9¾-10	10 -10¼	9¾-10
58-60 U. S. Motor gasoline	10 -10¼	10¼-10½	10 -10¼
60-62 400 E. P. gasoline	-	-12½	-12¾
64-66 390 E. P. gasoline	12¼-12½	12¾-13	12½-13
64-66 375 E. P. gasoline	12¾-13¼	13 -13½	12¾-13½
68-70 350-360 E. P. gasoline	13½-13¾	-13¾	13¾-14
NORTH LOUISIANA			
58-60 U. S. Motor 437 E. P.	-10½	10½-10¾	10¾-11¼
ARKANSAS			
58-60 450 E. P. gasoline	-10	10 -10¼	10 -10¾
58-60 U. S. Motor gasoline	-10½	10¾-11	10½-11¾
64-66 375 E. P. gasoline	13 -13¼	13¼-13¾	13½-13¾
CALIFORNIA			
54-56 U. S. Motor gasoline	-11	-11	-11
42-45 Engine distillate, 445-480 E.P.	8 - 9	8 - 9	8 - 9

Note: This is without the 2-cent state tax included in the price of California refiners for shipments within the state.

NEW ENGLAND (F. O. B. Boston and Fall River)			
U. S. Motor gasoline	-13½	-12¾	12¾-12½

NATURAL GASOLINE

(Note: End point of all grades, not over 375° F.)

OKLAHOMA			
Grade Double A	-10	-10	- 9¾
Grade A	-10¼	10¼-10¾	-10
Grade Double B	9 - 9¼	- 9	- 9
Grade B	9 - 9¼	9 - 9¼	- 9
Grade C	8½- 8½	8½- 8¾	- 8¾

NOTE—Specifications adopted by Ass'n of Nat. Gaso. Manufacturers
Grade Double A—80-87.9 gravity, 90% recovery, not over 375 E. P.
Grade A—72-79.9 gravity, 90% recovery, not over 375 E. P.
Grade Double B—84-92 gravity, 85% recovery, not over 375 E. P.
Grade B—76-83.9 gravity, 85% recovery, not over 375 E. P.
Grade C—80-90 gravity, 78% recovery, not over 375 E. P.

NORTH LOUISIANA			
Grade Double A	10¾-11	10 -10½	9½-10
Grade Double B	9¼-10	9½- 9¾	9 - 9¼
Grade C	9¼- 9½	8¾- 9	8¼- 8¾
F. O. B. Monroe District.			
NORTH TEXAS			
*Grade Double A	10 -10¼	-10	- 9¾
*Grade A	10 -10¼	10 -10¾	9¾- 9½
*Grade Double B	- 9¼	9 - 9¼	8¾- 8¾
*Grade B	- 9¼	9 - 9¼	8½- 8¾
*Grade C	8¾- 9	8¾- 9	8 - 8¼
*F. O. B. Breckenridge.			
CALIFORNIA			
78-84° 375 E. P.	15 -15½	15 -15½	15 -15½
PENNSYLVANIA			
68-70 Grav. 437 E. P.	13½-14	13¼-13¾	13 -13½
64-66 Grav. 437 E. P.	13½-14	13 -13½	13 -13½
60-62 Grav. 437 E. P.	13 -13½	12½-13	12½-13
68-70 Grav. 420 E. P.	14 -14½	14 -14½	14 -14½

BURNING OILS

PENNSYLVANIA			
45 Water White Kerosene	8½- 8¾	7¾- 8¼	7½- 7¾
46 Water White Kerosene	9 - 9¼	8½- 9	8¼- 8½
47 Water White Kerosene	- 9¾	9 - 9½	- 9
300 Burning Oil	8¼- 8½	- 8	7¾- 8
OKLAHOMA			
41-43 Water White Kerosene	- 6¾	6¼- 6½	5¾- 6¼
42-44 Water White Kerosene	7 - 7¼	6½- 6¾	6¼- 6½
KANSAS			
41-43 w. w. kerosene	6¾- 7	6½- 6¾	6 - 6¼
42-44 w. w. kerosene	7¼- 7½	7 - 7¼	6¼- 6½

NORTH TEXAS	Prices Feb. 15	Prices Feb. 8	Prices Feb. 1
41-43 Water White Kerosene	7 - 7¼	- 6¾	6 - 6¼
42-44 Water White Kerosene		- 6½	- 6½
NORTH LOUISIANA			
41-43 Water White Kerosene	7 - 7¼	6½- 6¾	6¼- 6½
ARKANSAS			
41-43 Water White Kerosene	7 - 7½	- 6¾	6¼- 6½
CALIFORNIA			
40-42 Water White Kerosene	5 - 5½	5 - 5½	5 - 5½
NEW ENGLAND			
40-43 Water White Kerosene	.....	.....	.....

NEUTRAL OIL

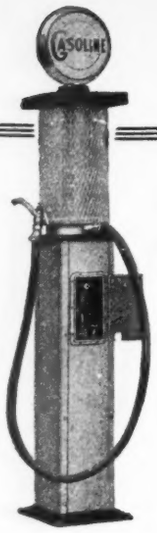
PENNSYLVANIA (Viscosity at 70° F.)			
220 Vis. No. 3 Assoc. Filt	-29	-28½	-28½
200 Vis. No. 3 Assoc. Filt	26½-27	26 -26½	-26
180 Vis. No. 3 Assoc. Filt	24½-25	24 -24½	23 -23½
150 Vis. No. 3 Assoc. Filt	20½-21	20 -20½	19½-20½
(Non-Viscous)			
34 Grav. 350-360 Flash	8½- 8¾	8 - 8½	8 - 8½
36 Miners Neutrals 300-305 Flash	- 7¾	7½- 7¾	7½- 7¾
OKLAHOMA (Viscosity at 100° F.)			
100 Vis. No. 2 color	7 - 7½	6½- 7	5½- 6
150 Vis. No. 3 color	10 -11	10 -11	9 -10
150 Vis. No. 4 color	- 9¾	- 9¾	- 8¾
180 Vis. No. 3 color	10 -10¾	10¾-10¾	9¾-10¼
180 Vis. No. 4 color	10½-11	-10½	9½-10¾
180 Vis. No. 5 color	9 -10¼	9 -10¼	- 9½
200 Vis. No. 3 color	11 -12	11½-13¼	10¾-11¾
200 Vis. No. 4 color	-11¾	-11¼	-10½
200 Vis. No. 5 color	10 -11¾	10 -11¼	9½-10½
220 Vis. No. 3 color	12½-12¾	-12¾	-11¾
220 Vis. No. 4 color	13 -13½	13 -13¼	12 -12¾
220 Vis. No. 5 color	-12¾	-12¾	-11¾
240 Vis. No. 3 color	14¼-15	15 -16	-14
240 Vis. No. 4 color	-14½	-14½	-13½
240 Vis. No. 5 color	-14	-14	-13
280 Vis. No. 3 color	15¾-17	-17	-16
280 Vis. No. 4 color	-16½	-16½	-15½
280 Vis. No. 5 color	-16	-16	-15
300 Vis. No. 5-6 color	17 -18½	17 -18½	17 -17½
GULF COASTAL (Viscosity at 100°F; cold test 0)			
100 Vis. No. 2 Color Unfilt. Pale	7½- 8	7½- 8	7½- 8
200 Vis. No. 3 Color Unfilt. Pale	11½-12	11½-12	11½-12
300 Vis. No. 3 Color Unfilt Pale	13½-14	13½-14	13½-14
500 Vis. No. 3½ Color Unfilt. Pale	15½-16	15½-16	15½-16
750 Vis. No. 4 Color Unfilt. Pale	19½-20½	19½-20½	19½-20½
200 Vis. No. 5½ Color Red Oil	10 -10½	10 -10½	10 -10½
300 Vis. No. 5½ Color Red Oil	12 -12½	12 -12½	12 -12½
500 Vis. No. 6 Color Red Oil	13½-14	13½-14	13½-14
750 Vis. No. 6 Color Red Oil	18 -18½	18 -18½	18 -18½
CALIFORNIA (Viscosity at 100° F.)			
100 Vis. No. 2 color	11 -11½	13½-14½	13½-14½
100 Vis. No. 3 color	8½- 9	9 -10	9 -10
200 Vis. No. 3 color	13½-14	14½-15½	14½-15½
300 Vis. No. 3 color	15 -15½	14 -16	14 -16
450 Vis. No. 3½ color	18 -18½	19½-20½	19½-20½
550 Vis. No. 3 color	20 -21	21½-22½	21½-22½
600 Vis. No. 3½ color	21 -22	23½-24½	23½-24½
100 Vis. No. 5 color	7 - 8	8 - 9	8 - 9
200 Vis. No. 5 color	12 -12½	13½-14½	13½-14½
300 Vis. No. 5 color	13 -14	14 -15	14 -15
400 Vis. No. 5 color	15 -16	16 -17	16 -17
500 Vis. No. 5 color	16 -17	17 -18	17 -18
600 Vis. No. 6 color	17 -18	18 -19	18 -19
700 Vis. No. 7 color	18 -19	19½-20½	19½-20½

CYLINDER STOCKS

OKLAHOMA			
190-210 Vis. at 210° Bright Stock	31 -35	31 -35	30 -35
150-160 Vis. at 210° Bright Stock	28 -31	28 -31	17 -31
600 E Stock, 140-150 Vis. @ 210°	18 -20	18 -20	18 -20
600 Steam Refined Olive Green	9 -11½	8½-11	8½-10
600 Steam Refined Dark Green	6½- 8	6½- 8	6 - 6¼
Black Oil	- 5	- 5	- 5
PENNSYLVANIA (1-inch Immersion Test)			
600 Steam Refined	18 -19	18 -18½	18 -19
635 Steam Refined	21½-22	21 -22	21½-22
650 Steam Refined	23½-24	23 -24	23½-24½
600 Flash	26½-27	26 -27	26 -27
625 Flash Steam Refined	-36		
600 Warren E	-22½	21½-22	22½-23
600 Oil City E	-20½	20½-21	-22
600 Filtered D	27 -28	-28	28 -29
Cold Test Stocks (bright filtered)	38½-39	38½-39	38 -39
Cold Test Stock (dark filtered)	36½-37	36½-37	36 -37
Black Oil	- 8	- 8	- 8

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher.)

Above prices are f. o. b. refinery in tank car. They are the prices at which the bulk of the products on the open market move. Whoever has knowledge of any open market prices on any considerable quantity of goods differing from the foregoing, will favor us with this information.



WANTED! *Live Salesmen to Handle the Fastest Selling Visible Pump on the Market*

A Sensational Pump at a Sensational Price

Dart
BUILT BY OIL MEN FOR OIL MEN

VISIBLE PUMPS

"I had wonderful success in selling your pumps in Kansas territory, as, at the time, I added your pumps to my other lines of equipment. Every pump that I sold gave my customers satisfaction and, as several said, they were very easy to operate, being fast, and could not be equalled for the money any place. I also had a large percentage of reorders which speaks very highly, I believe."
Yours very truly,
Chas. Benj. Lopp,
Columbus, Kansas.

Salesmen who took territory when this offer was first made are literally cleaning up and making from $100 to $500 per week.

It is no wonder this Dart visible sells. Why shouldn't it? Station owners can save 40% on the cost of pumps and it meets every requirement for an attractive, accurate, durable pump for any station. It sells far below competitive prices and users say it stands up beside the highest-priced pump without apology. It sells so easily because of its large, massive construction, its remarkable performance and its broad guarantee—and because it costs so much less.

There are still a few good district territories open and one or two states. (No more than one state allowed to one agent.)

This is positively one of the best high-class money-making opportunities for Salesmen. Why not start the year with an addition to your present income, or make more in 1926 than you did last year? It is highly profitable either as a side line or full time. Don't wait. Grab this while it is open.

Write at once for Full Particulars

Goward Dart Company

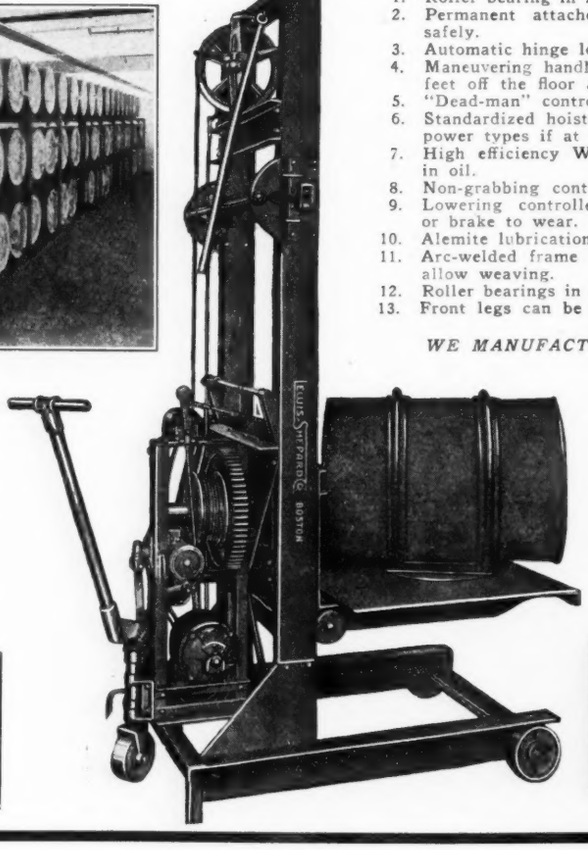
WATERLOO, IOWA

The "Ford" Pump of the Oil Industry. "Made by Oil Men for Oil Men"

Thirteen Outstanding Worm Drive Stacker Superiorities

1. Roller bearing in large diameter sheave wheel.
2. Permanent attached pipe handle for lowering upper section safely.
3. Automatic hinge lock—operates if operator forgets.
4. Maneuvering handle free in all positions. You can lift the base feet off the floor and steer with handle at any side position.
5. "Dead-man" control—if operator removes hand machine stops.
6. Standardized hoisting units—very easy to change from hand to power types if at any time desired.
7. High efficiency Worm Drive, completely enclosed and running in oil.
8. Non-grabbing control—no shock when stopping.
9. Lowering controlled by motor acting as brake—no governor or brake to wear.
10. Alemite lubrication at eight points.
11. Arc-welded frame throughout—no bolts or rivets to loosen and allow weaving.
12. Roller bearings in all floor wheels.
13. Front legs can be elevated a full inch off floor.

Lewis - Shepard Barrel and Drum Racks are made of channel. You do not pay for more steel than necessary. All units are arc-welded, making a more permanent and rigid assembly than riveting. Easily assembled. Made any height and to fit any shape of floor area.



WE MANUFACTURE THE FOLLOWING TYPES OF STACKERS

1. Hand power.
2. Light Duty Worm Drive electric.
3. Heavy Duty Worm Drive Stackers.
4. Special for 500 lb. loads.
5. Telescoping Stackers.
6. Barrel and Drum Stackers.
7. Tier Lift Stackers.
8. Special designs when required.

LEWIS-SHEPARD CO.
143 Walnut St. Watertown Station
Boston Mass.

SEND FOR 1926 CATALOG

Roller bearing turntable handles drums of oil much easier than when entire machine must be turned on revolving base. Can be installed on any type stacker.

MATERIAL HANDLING EQUIPMENT
Lewis-Shepard
BOSTON

Refinery Markets on Wax and Heavy Oil Products

Pennsylvania, Oklahoma, North and South Texas, Louisiana, Arkansas, California

WAX

PENNSYLVANIA	Prices Feb. 15	Prices Feb. 8	Prices Feb. 1
	(Per Pound, New York)		
122-124 White Crude Scale..	– 5⅜	– 5⅜	– 5⅜
124-126 White Crude Scale..	– 5½	– 5½	– 5½
OKLAHOMA			
	(Per Pound, Group 3)		
124-126 White Crude Scale..	5 – 5⅜	4¾– 5	– 4⅞
CALIFORNIA			
White Crude Scale.....	6 – 6½	6 – 6½	6 – 6½

FUEL OIL

PENNSYLVANIA			
36-40 Fuel Oil.....	6¼– 6½	6 – 6½	6¼– 6½
30-34 Fuel Oil.....	5¾– 5⅞	5¾– 6¼	6 – 6¼
28-30 Fuel Oil.....	5¾– 5⅞	5¾– 6	5¾– 6
OKLAHOMA			
38-40 Straw distillate.....	– 4	– 4	3⅞– 4
36-38 Straw distillate.....	3¾– 3⅞	3¾– 3⅞	3¾– 3¾
32-36 Gas oil (Gal.).....	– 3¾	– 3¾	3¾– 3¾
26-30 Fuel oil (Bbl.).....	1.27½–1.30	1.27½–1.30	1.22½–1.27½
22-26 Fuel Oil (Bbl.).....	1.17½–1.22½	1.20 –1.22½	1.17½–1.20
18-22 Fuel oil (Bbl.).....	1.15 –1.17½	1.17½–1.20	1.15 –1.17½
KANSAS*			
38-40 Light straw distillate..	4¼– 4½	4¼– 4½	4¼– 4½
36-38 Light straw distillate..	4 – 4⅛	4 – 4⅛	4 – 4⅛
32-36 gas oil.....	3¾– 4	3¾– 4	3¾– 4
18-22 Fuel oil.....	1.20 –1.25	1.20 –1.25	1.20 –1.25
24-26 Fuel oil.....	1.25 –1.35	1.25 –1.35	1.25 –1.35

*F. O. B. refinery, Kansas destination.

NORTH TEXAS	Prices Feb. 15	Prices Feb. 8	Prices Feb. 1
36-40 Straw Distillate.....	3⅛– 3¼	3¼– 3⅜	3¼– 3⅜
32-36 Gas Oil (Gal.).....	– 3⅛	3⅛– 3¼	3⅜– 3½
24-26 Fuel per (Bbl).....	1.22½–1.30	1.25 –1.30	1.25 –1.30
GULF COASTAL			
Fuel.....	1.55 –1.65	1.55 –1.65	1.55 –1.65
Gas Oil.....	– 5¼	– 5	– 5
NORTH LOUISIANA			
32-36 Light Gas Oil (Gal.)...	3¼– 4	3¼– 4	3¼– 4
18-22 Fuel Oil (Bbl.).....	1.15 –1.20	1.10 –1.15	1.10 –1.15
ARKANSAS			
32-36 Gas Oil.....	3¼– 4	3¼– 4	3¼– 4
Road oil.....	–1.26	–1.26	.....
Smackover Crude Fuel.....	1.15–1.25	–1.15	1.05 –1.07½
CALIFORNIA*			
14-18 Fuel Oil (Bbl.).....	1.00	1.00	1.00
14-18 Bunker Oil (Bbl.).....	1.00	1.00	1.00
24-30 Gas Oil (Bbl.).....	1.15	1.15	1.15
27 + Diesel Oil (Bbl.).....	1.15	1.15	1.15

*(San Joaquin Valley, San Francisco 4c per bbl. more.)

NEW ENGLAND (F. O. B. Boston and Fall River)			
30-32 gas oil (gal.).....	– 5⅞	– 5¾	– 5⅝
Fuel Oil (Bunker C) bbl.....	–1.83½	–1.82	–1.82½

Above prices are f. o. b. refinery in tank car. They are the prices at which the bulk of the products on the open market move. Whoever has knowledge of any open market prices on any considerable quantity of goods differing from the oregoing, will favor us with this information.

(Continued from page 113)

may not prove such a detriment as many have been dolefully predicting.

One of the main causes for the lack of demand at present is traceable to the jobbers. Many of the larger ones bought freely before the recent tank-wagon changes, obtaining their material around 9½ to 9¾ cents. They have their tanks fairly full, and can stay out of the market from one to four weeks longer in some cases.

One larger refinery is reported to have held open its offer of 58-60 U. S. Motor gasoline at 9¾ cents a gallon for three days after Mid-Continent crude was advanced on February 1. This offer was held open despite the fact that refiners generally boosted prices to 10¾ to 11 cents in Oklahoma the day crude was advanced.

Cold weather in the Mid-Continent's consuming territory also is blamed in part for the lack of demand just at present. Marketers who have already bought their stuff, say they are not getting the business they expected even after tank-wagon advances. Although many pleasant days have been reported, the weather has not moderated for a sufficient period to allow country dirt roads in the north and east to become passable again.

The weakness of gasolines has caused some distress material to be offered at bargain prices this week. One refiner in Oklahoma is reported to have offered a big export buyer up to 2,000,000 gallons of U. S. Motor gasoline at 10 cents per gallon, provided the material was moved out of the field within a short time. The buyer, however, had been ordered out of the market for the time being, and turned down the offer.

One or two refiners today cut their resale price on U. S. Motor gasoline to 10¼ cents. The majority of them, however, rode out the week refusing to sell under 10½ cents, while a few still clung to 10¾ cents. Two or three still were asking 11 cents.

Export Activity

One export buyer of 64-66, 375 end point gasoline was actively in the field near the close of the week. The Atlantic Refining Co. bought a quantity of material in both Oklahoma and Texas. The gallonage was reported to be around three or four million, but the exact amount placed in the two fields was not learned.

Earlier in the week the Atlantic was reported to have taken some options on export gasoline at 13 cents in Texas. Some of those options were exercised, it was indicated, while some material was bought under 13 cents. In Oklahoma material was purchased as low as 12¾ cents in one or two instances.

A small quantity of export gasoline was bought in Oklahoma by another exporter early in the week. The purchase was primarily an accommodation buy, it was explained. One or two other exporters also are reported to have bought small quantities of distress material during the week.

The Standard Oil Co. of New Jersey several days ago advanced the price of export gasoline 1 cent along the Atlantic seaboard. The Standard of Louisiana, however, failed to follow the pace set by its parent company. This caused a good deal of complaint from refiners with contracts based on the Gulf export postings.

Refiners were confident the advance would come within a day or two, and that it would be at least 1 cent. Many expected 1¼ cents.

All prices and market information printed herein have been gathered by the staff of National Petroleum News from reliable sources and so far as can be ascertained thoroughly represent the going market as defined for each product on the date given for those particular prices. Both buyers and sellers have been checked in the gathering of this information and actual sales studied.

These prices and this information are subject at all times to correction for errors. Anyone having knowledge of any facts which would indicate anything different from the information which is given, is especially urged to send in those facts to the head office of National Petroleum News at once, or take them up with the nearest representative. All such facts will be promptly and thoroughly investigated.

The staff of National Petroleum News is cognizant of the fact that this market information has come to have a high standing in the industry. It wants to not only maintain that standing, but to improve it and to that end, invites the co-operation of the entire oil industry.

Gasoline Prices Slip In Chicago Market

CHICAGO, Feb. 15.—Since the tank wagon advance in Standard Oil Co. of Indiana territory on Feb. 4 and the upturn in the refinery price that anticipated it, the gasoline price in the Chicago resale market has been slipping. Carload marketers in this vicinity stated, as much as a week ago, that they were in a position to shade the prevailing refinery quotation on U. S. Motor gasoline, and now the price is 10¼ to 10½ cents a gallon in Chicago on a group 3 basis, with an occasional car moving as low as 10 cents, it is said.

What is true of U. S. Motor is true to a slightly less degree of the lighter grades of gasoline. Export material of 64-66 gravity is quoted over a rather wide range. Refiners are holding firm at 13¼ cents a gallon but resale agents occasionally release a shipment as low as 12¾ cents. The reaction of the lighter materials was not as sharp as that of the competitive grade in response to the tank wagon revision, but U. S. Motor is now down close to the level it occupied before its upturn of nearly two weeks ago.

Kerosene is fairly active in the Chicago market. Material of 42-44 gravity is so scarce and so little traded in as to be hardly a factor in the market. The ruling quotation is 7⅛ to 7¼ cents. But 41-43 kerosene is up ¼ of a cent over the current week, fairly scarce and in good demand. The price is 6¾ to 6⅞ cents a gallon and indications point to even higher prices unless more refiners increase the supply by beginning to make the cut. It is the generally accepted theory that scarcity in the field is the real basis for the present prices as the demand is not extraordinary.

The weather next week will not be such as to stimulate the use of gasoline but probably the demand for burning oil will not be affected by it—that is if one is willing to accept the government forecast for the week ending Feb. 20. The official outlook for the week is for temperature considerably below normal and for scattered snows throughout Standard Oil Co. of Indiana territory except in the most southerly states where the precipitation will be in the form of rain. Weather during the week just closing has not been so bad for the consumption of gasoline. There was not much rain or snow in the regions south and west of Chicago and the temperatures were mild so motoring was not interfered with except by mud.

Partly as a result of the mild temperatures, distillate has been rather a dead item on the local market. Material suitable for domestic fuel is reasonably abundant and is offered freely at 4 cents flat. Gas oil, on the contrary is enjoying a better demand. It has remained reasonably active most all week and is quoted currently at 3¾ to 3⅞ cents a gallon. This strength is confined to that particular material, however, for fuels oils are easy.

Oklahoma refinery fuel of 18-22 gravity is quoted generally at $1.17½ to $1.20 while 22-26 is steady around $1.22½. Prices on Smackover crude fuel have not changed over the week but remain firm to strong at $1.10 to $1.15 a barrel.

TULSA—Marland Refining Co. is building service stations and warehouses at Parsons and Columbus, Kan. A new service station is being built at Hammond, Ind., and improvements are being added to properties at Evansville, Ind.

Recent openings of new Marland stations have been held at Baxter Springs and Independence, Kan., and Miami, Okla.

TULSA—The Western Petroleum Refiners Association has recently added to its membership the Pierce Petroleum Corp. and the Olney Oil & Refining Co. according to an announcement by Howard Bennette, managing director.

PLATT'S
OILGRAM
Petroleum Markets-Every Day

Do You Guess?

DO you "guess" what the oil markets will be from day-to-day?

Do you "guess" when it's most advantageous for you to buy?

Or, do you KNOW?

Did you ever stop to think that your whole season's profits depend largely on how well you KNOW when to place your order?

Your foresight in knowing whether to buy today or tomorrow—this week or next—determines your profits to a large extent.

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The saving of ⅛c on a few cars will repay its cost to you in one order. A whole year for $75, or three months for $25, payable in advance. Send for your service *today* to the nearest mailing point.

TULSA—608 Bank of Commerce Bldg.
CHICAGO—360 N. Michigan Ave.
CLEVELAND—832 Caxton Bldg.

Week's Price Changes Tank Wagon Market

Gasoline

Standard of New Jersey—T.w. and s.s. prices advanced 1 cent, through territory, **Feb. 12.**

Standard of New York—T.w. and s.s. prices advanced 1 cent, through territory, **Feb. 13.** T.w. and s.s. prices were advanced 1 cent at Buffalo, on **Feb. 4** to 16 cents and 19 cents respectively.

Atlantic Refining—T.w. and s.s. prices advanced 1 cent, New England, **Feb. 12.** S.s. price at Hartford, Conn., was advanced 2 cents to 23 cents. T.w. price only at Erie was advanced 2 cents to 17 cents.

Standard of Kentucky—T.w. and s.s. prices advanced 1 cent, through territory, **Feb. 15.**

Standard of Louisiana—T.w. and s.s. prices advanced 1 cent, Louisiana and Arkansas, and 1 cent, 1½ cents and some points 2 cents, in Tennessee, **Feb. 12** A revised list of prices in these states has not reached National Petroleum News from the Standard Oil Co. of Louisiana, hence Tennessee points in the tank wagon table have not been corrected to show this advance because of the irregularity of advances in that state. The table in next week's issue will be corrected.

Standard of Indiana—T.w. and s.s. prices at Pierre, Huron and Bartlesville have been adjusted to conform with the present schedules.

Magnolia Petroleum—T.w. and s.s. prices advanced 1 cent through territory, **Feb. 9.**

Continental Oil—T.w. and s.s. prices advanced 1 cent, Boise, Ida., and ½ cent generally in Utah, **Feb. 9.** T.w. and s.s. prices reduced 1 cent, Pueblo, Colo., to 19 cents and 21 cents respectively, **Feb. 11.**

Canada—S.s. price only advanced 1 cent, to 34 cents, at Halifax, N. S. **Feb. 8.**

Kerosene Changes

Atlantic Refining—T.w. price advanced 1 cent, to 16 cents, in Pennsylvania and Delaware, and from 1½ to 2 cents in New England, **Feb. 12.** Springfield, Worcester and Hartford were advanced 1½ cents, and Boston, Providence and New Haven 2 cents, bringing all points to 16 cents, excepting Hartford which became 15 cents.

Standard of Louisiana—T.w. advanced 1 cent, through territory, **Feb. 9.**

Magnolia Petroleum—T.w. prices advanced through territory to 12 cent level, excepting Arkansas, which was advanced to 13.5 cent level, **Feb. 9.** Muskogee was advanced 3 cents to 12 cents; Little Rock, 1 cent to 13.5 cents; Dallas, 1 cent, Fort Worth and San Antonio 2 cents, to 12 cents.

TULSA—The Empire Gas & Fuel Co. is surveying for the construction of a 23-mile gas line to the Davenport field. The line will hook onto the Empire system at the Drumright compressor station.

Tank Wagon, Service Station Markets for Gasoline and Kerosene In United States Territories and Canada

BELOW are give in cents a gallon, the tank wagon price of gasoline without the special taxes levied against motor fuels by many states, the amount of the state taxes, the total tank wagon price, with tax added in and the service station or retail price of gasoline as quoted by the Standard Oil Companies in their various marketing territories. The right hand column is the tank wagon price of kerosene. By tank wagon price is meant the price to resale agents or dealers.

These Prices in Effect February 15, 1926

S.O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
Atlantic City, N. J.	16	0	16	*	15
Newark, N. J.	16	0	16	18	15
Annapolis, Md.	16	2	18	*	14.5
Baltimore, Md.	16	2	18	21	12
Cumberland, Md.	16	2	18	21	15
Washington, D. C.	16	2	18	21	14
Danville, Va.	16	3	19	*	15
Norfolk, Va.	16	3	19	22	15
Richmond, Va.	16	3	19	22	15
Roanoke, Va.	16	3	19	22	15
Petersburg, Va.	16	3	19	*	15
Williamsburg, Va.	16	3	19	*	15
Charleston, W.Va.	16	3½	19.5	22.5	15
Clarksburg, W.Va.	16	3½	19.5	22.5	15
Keyser, W.Va.	16	3½	19.5	*	15
Parkersburg, W.Va.	16	3½	19.5	22.5	15
Wheeling, W.Va.	16	3½	19.5	22.5	15
Charlotte, N. C.	16	4	20	23	15
Hickory, N. C.	16	4	20	*	15
High Point, N. C.	16	4	20	*	15
Mt. Airy, N. C.	16	4	20	*	15
Salisbury, N. C.	16	4	20	*	15
Charleston, S. C.	16	5	21	24	15
Columbia, S. C.	16	5	21	24	15

*Dealers set own prices. S.O. New Jersey does not operate station.

S. O. NEW YORK

*New York City	18	0	18	22	16
Albany, N. Y.	†18	0	†18	†20	16
Buffalo, N. Y.	17	0	17	20	16
Rochester, N. Y.	†17	0	†17	†21	16
Syracuse, N. Y.	18	0	18	20	15
Boston, Mass.	18	0	18	21	16
Augusta, Me.	18	3	21	24	16
Manchester, N. H.	18	2	20	24	16
Burlington, Vt.	20	2	22	25.5	16

*In steel barrels.

†At Rochester and Albany, Standard sells two grades of gasoline, the above price applying to its Socony grade, and another grade being sold 2c below this price.

ATLANTIC REFINING

Pittsburgh, Pa.	17	0	17	*22	16
Philadelphia, Pa.	17	0	17	*22	16
Allentown, Pa.	17	0	17	*22	16
Erie, Pa.	17	0	17	*20	16
Scranton, Pa.	17	0	17	*22	16
Altoona, Pa.	17	0	17	*22	16
Dover, Del.	17	2	19	22	16
Wilmington, Del.	17	2	19	22	16
Providence, R. I.	18	1	19	22	16
Springfield, Mass.	18	0	18	20	16
Worcester, Mass.	18	0	18	20	16
Hartford, Conn.	18	2	20	23	15
New Haven, Conn.	18	2	20	23	16
Boston, Mass.	18	0	18	21	16

*Contains 2-cent tax collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Lexington, Ky.	16	3	19	22	16
Louisville, Ky.	18	3	21	24	14
Covington, Ky.	18	3	21	24	16
Clarksdale, Miss.	17	3	20	23	14
Jackson, Miss.	17	3	20	23	13
Natchez, Miss.	16.5	3	19.5	22.5	13.5
Vicksburg, Miss.	16.5	3	19.5	22.5	13.5
Birmingham, Ala.	18	2	20	23	16.5
Mobile, Ala.	17	2	19	22	14
Montgomery, Ala*	19	2	21	24	17.5
Atlanta, Ga.	†19	3½	23	26	17
Augusta, Ga.	†19	3½	23	26	16.5
Macon, Ga.	†19	3½	23	26	15.5
Savannah, Ga.	†14	3½	18	21	15
Jacksonville, Fla.	17	4	21	24	15
Miami, Fla.	19	4	23	26	16.5
Tampa, Fla.	17	4	21	24	15
Pensacola, Fla.	17	4	21	24	15.5

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia has ½ cent per gal. inspection fee on gasoline which is deducted as well as the state gasoline road tax of 3½ cents, to get the actual net tank wagon market to dealer.

S. O. INDIANA

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
Chicago, Ill.	†17	0	†17	19	12
Decatur, Ill.	17.2	0	17.2	19.2	12.5
E. St. Louis, Ill.	16.1	0	16.1	18.35	11.6
Joliet, Ill.	17.4	0	17.4	19.4	12.7
Peoria, Ill.	17.2	0	17.2	19.2	12.5
Quincy, Ill.	17.2	0	17.2	19.2	12.3
Indianapolis, Ind.	17.2	3	20.2	22.2	12.7
Evansville, Ind.	17	3	20	22	12.5
South Bend, Ind.	17.4	3	20.4	22.4	12.9
Detroit, Mich.	17.8	2	19.8	21.8	13.2
Grand Rapids, Mich.	17.7	2	19.7	21.7	13.1
Saginaw, Mich.	17.9	2	19.9	21.9	13.3
Madison, Wis.	17.3	2	19.3	21.3	12.5
Milwaukee, Wis.	17.1	2	19.1	21.1	12.3
La Crosse, Wis.	18.2	2	20.2	22.2	13.4
Minneapolis, Minn.	18.2	2	20.2	22.2	13.6
Duluth, Minn.	18.5	2	20.5	22.5	13.6
Mankato, Minn.	18.1	2	20.1	22.1	13.4
Des Moines, Iowa.	17.5	2	19.5	21.5	12.9
Davenport, Iowa.	17.5	2	19.5	21.5	12.9
Sioux City, Iowa.	17	2	19	21	12.5
Mason City, Ia.	17.5	2	19.5	21.5	12.9
St. Louis, Mo.	**16.6	2	18.6	20.9	12
Kansas City, Mo.	††17.9	2	19.9	21.9	11.3
St. Joseph, Mo.	**17	2	19	21	11.9
Fargo, N. D.	19.9	1	20.9	22.9	15.6
Grand Forks, N.D.	20.2	1	21.2	23.2	15.9
Minot, N. D.	19.9	1	20.9	22.9	15.6
Pierre, S. D.	15	3	18	*	14.1
Huron, S. D.	16	3	19	21	14.1
Wichita, Kans.	16.3	2	18.3	21.3	11.8
Bartlesville, Okla.	14.4	3	17.4	19.4	10.9

†Dumps of 100 or more gallons at 16c per gallon.
*S. O. Indiana does not operate station.
**Includes city tax of ½c.
††Includes city tax of 1c.

S. O. NEBRASKA

Crawford, Neb.	18	2	20	*	13.25
Omaha, Neb.	16.25	2	18.25	20.25	12.5
McCook	18.75	2	20.75	22.75	14
Norfolk	17.75	2	19.75	21.75	13
North Platte	18.75	2	20.75	22.75	13.75
Scottsbluff	18.25	2	20.25	22.25	13.25

*Standard has no service station here.

CONTINENTAL OIL

Denver, Colo.	18	2	20	22	15.5
Pueblo, Colo.	17	2	19	21	15.5
Casper, Wyo.	18	2½	20.5	22.5	14
Cheyenne, Wyo.	19	2½	21.5	23.5	15.5
Butte, Mont.	20	2	22	22	17
Helena, Mont.	22	2	24	26	18
Salt Lake City, Utah	20	3½	23.5	25.5	18
Boise, Ida.	22	3	25	27	20
Albuquerque, N.M.	21.5	3	24.5	27.5	17.5

S. O. CALIFORNIA

Phoenix, Ariz.	20	3	23	26	21.5
Los Angeles, Cal.	10.5	2	12.5	18.5	15.5
Fresno, Cal.	14.5	2	16.5	20.5	17.5
San Francisco, Cal.	14	2	16	20	15.5
Reno, Nev.	17.5	4	21.5	25.5	19
Portland, Ore.	14	3	17	21	16.5
Seattle, Wash.	14	2	16	20	16.5
Spokane, Wash.	18	2	20	24	20.5
Tacoma, Wash.	14	2	16	20	16.5

S. O. LOUISIANA

Little Rock, Ark.	15	4	19	22	14.5
Alexandria, La.	15	2	17	20	14.5
Baton Rouge, La.	14	2	16	19	13
Lake Charles, La.	15.5	2	17.5	20.5	14.5
New Orleans, La.	*15.5	2	17.5	20.5	13.5
Shreveport, La.	14	2	16	19	13.5
Lafayette, La.	16	2	18	20	14
Bristol, Tenn.	†15.5	3	18.5	21.5	15
Chattanooga, Tenn.	†14	3	17	20	15
Knoxville, Tenn.	†15	3	18	21	15.5
Nashville, Tenn.	†14	3	17	20	15
Memphis, Tenn.	†13.5	3	16.5	19.5	14.5

*Includes 1c city tax on gasoline and kerosene.

†Gasoline prices in Tennessee were advanced 1c, 1½c and some points 2c on Feb. 12. Prices shown above do not show advances, in Tenn., but table in next week's issue will be corrected.

S. O. OHIO

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
All Ohio points	19	2	21	23	15

MAGNOLIA PETROLEUM

Muskogee, Okla.	17	3	20	23	12
Oklahoma City	17	3	20	23	12
Tulsa, Okla.	13	3	16	19	12
Fort Smith, Ark.	15	4	19	22	13.5
Little Rock, Ark.	15	4	19	22	13.5
Texarkana, Ark*	17	4	21	24	13.5
Dallas, Tex.	15	1	16	20	12
El Paso, Tex.	18	1	19	20	13
Fort Worth, Tex.	14	1	15	17	12
Houston, Tex.	16	1	17	20	12
San Antonio, Tex.	15	1	16	17	12

*Within city of Texarkana, Ark., the state tax on gasoline is 1c per gal. conforming with the Texas state tax. In Texarkana district outside of the city the 4c state tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline)

	Oleum Spirits	V.M.&P. Naphtha	Cleaners Naphtha
Chicago	19	21	21
Detroit	20.2	22.7	22.7
Kansas City	19.2	21.2	21.2
Milwaukee	19.2	23.7*	23.7*
Minneapolis	20.5	25*	25*
St. Louis	18.4	20.9	22.2
New York		17	....

*Including state tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
Toronto	23.5	3	26.5	30	20
Ottawa	24.5	3	27.5	31	21
Cochrane	28.5	3	31.5	35	24.5
Ft. William	27.5	3	30.5	34	22.5

MANITOBA

Winnipeg	27.5	3	30.5	34	22.5

SASKATCHEWAN

Regina	30.5	0	30.5	34	25.5

ALBERTA

Edmonton	31.5	2	33.5	37	27.5
Calgary	29.5	2	31.5	35	25.5

BRITISH COLUMBIA

Vancouver	21	3	24	28	23

QUEBEC

Montreal	23.5	3	26.5	30	20
Quebec City	25.5	3	28.5	32	22
Three Rivers	25.5	3	28.5	32	22

NEW BRUNSWICK

St. John	26.5	0	26.5	31	25
Moncton	26.5	0	26.5	31	25

NOVA SCOTIA

Halifax	26.5	3	29.5	34	23
Sydney	28.5	3	31.5	32	25

PRINCE EDWARD ISLAND

Charlottetown	26.5	2	28.5	33	23

Note: In districts surrounding these points 1c additional is added to city price.

Complete Export Markets

New York | Gulf Coast | California

Higher Prices Bring Increased Buying for Foreign Account

By Special Correspondent

NEW YORK, Feb. 15

FURTHER advances in major petroleum products brought about a much improved export demand for both kerosene and gasoline. French and Spanish buyers were credited with most of the purchases. Kerosene was stronger at New York and steady at New Orleans. The announcement by the Standard Oil Companies of New York and New Jersey of an advance of one cent a gallon in kerosene tank wagon prices resulted in an advance of one cent a gallon in bulk water white at Atlantic Seaboard refineries.

Gas oil was advanced ½ cent a gallon at New York harbor refineries but remained unchanged at the Gulf. Bulk gasoline was unchanged. Lubricating oils were a trifle softer.

Gasoline—New York

As the week closed, local refiners were asking 12 cents a gallon for spot U. S. Motor in bulk at the refineries and 12½ cents a gallon for future deliveries. A large United Kingdom buyer was inquiring for a cargo of 50,000 barrels, of U. S. Motor 64 gravity and water white kerosene. One of the leading refiners expects to close this deal early this week. A French buyer was inquiring for a cargo of 42,000 barrels of U. S. Motor, 64 gravity gasoline and prime and water white kerosene, for March shipment.

Demand for cased gasoline is more active, probably due to the bullish rumors current. One of the large independents booked an order for 35,000 cases of 64-66 and U. S. Motor gasoline for March shipment to Australasia, while another large independent closed a sale of 25,000 cases of motor and 64 gravity for March shipment to the Near East. The local trade is looking for an advance in export prices shortly.

Gasoline—Gulf Ports

One of the leading refiners booked two bulk cargoes. One called for 45,000 barrels of 61-63 gravity and prime white which sold at 13½ and 6¾ cents respectively, March clearance to France and the other 35,000 barrels of 61-63 and prime white kerosene at the same prices for March shipment to France. One of the big independents was rumored to have sold a cargo of 40,000 barrels of U. S. Motor at 11¾ cents; 64-66 at 14¾ cents and prime and water white kerosene at 7 and 8 cents respectively for March shipment to the United Kingdom.

Cased gasoline again advanced 5 cents a barrel, and U. S. Motor in cargo lots was held at $2.40 a case as the week closed and 64-66 at $2.70 a case. Cased gasoline however was very quiet. There is a fairly heavy contract movement going on but new buying was light. One of the big independents booked an order for 20,000 cases for March shipment to Australasia while there was an inquiry from Japan for 30,000 cases, but this has not yet been closed.

Gasoline—Domestic

Early in the week Sinclair Consolidated Oil advanced U. S. Motor ½-cent a gallon to 12½ cents a gallon, and this was immediately followed by most of the other big refiners. The jobbing demand has improved considerably and the trade is now looking for a sharp advance in gasoline tank wagon prices. U. S. Motor in tank cars delivered to the trade is now held at 13½ cents a gallon. At Philadelphia the price for U. S. Motor in tank cars at the refineries is 12½ cents a gallon.

Kerosene—New York

Export inquiries were a little more numerous but actual buying was light. However bulk water white was advanced to 9 cents a gallon, at the refineries by virtually all of the big factors while prime white has been marked up to 8 cents at the refineries. There was an inquiry in the market for 20,000 cases of prime and water white kerosene for nearby shipment to South America but this failed to materialize. One of the smaller exporters is working on an inquiry for 15,000 cases of water and prime white for March shipment to the Near East.

Kerosene—Gulf Ports

Water white was firm at 8 cents a gallon but prime was weak at 7 cents with persistent reports of offerings at 6¾ cents a gallon. No bulk sales other than already reported were recorded. The inquiry for cased kerosene is more active and one of the leading independents is working on an inquiry from China for 40,000 cases of prime and water white for March shipment. There was also an inquiry for 20,000 cases for March shipment to Australia but this is still pending. Cased water white in cargoes is held at $1.70 a case and prime at $1.60 a case.

Kerosene—Domestic

Demand for water white is better. Jobbers are buying in a larger way since the advance. There is virtually no water white available now below 9 cents a gallon at the refineries and 10 cents a gallon in tank cars delivered to the trade. The tank wagon price is quoted at 16 cents a gallon an advance of one cent over last week's price. Several observers are predicting further gains shortly.

Bunker Oil—New York

Very quiet conditions prevailed, and grade C was firm at $1.75 a barrel. Export demand was sluggish but there is a heavy contract delivery which is keeping stocks down. The f.a.s. New York Harbor price is held at $1.81½ a barrel. Diesel oil is marking time at $2.00 a barrel at the refineries. The movement is mainly on contract.

Bunker Oil—Gulf Ports

Prices are firmer but unchanged. Grade C is held at $1.60 a barrel f. o. b. New Orleans, for bunkering and $1.50 in cargoes, but the latter price is almost entirely nominal as no cargoes are offering around at present. At Tampico the price for grade C is $1.45 a barrel taxes included while heavy Panuco crude oil is quoted at $1.15 a barrel, taxes to be added.

Waxes—New York

Demand for virtually all of the waxes was light. Export and domestic buying orders are confined to actual requirement but nevertheless a steady tone prevailed at all times. White crude scale 122-124 A.M.P. in slack barrels, was held at 5¼ cents a pound while semi refined 122-124 A.M.P. was offered more freely at 5⅜ cents a pound.

Fully refined waxes were less freely offered although stocks are large. For 120-122 A.M.P. most factors were asking 6 cents a pound while one or two were quoting 6⅛ cents. The asking prices for 123-125 and 125-127 A.M.P. was 6⅛ cents a pound. Match wax was quiet and unchanged at 6 cents a pound for 105-108 A.M.P.

Waxes—Gulf Ports

No orders of consequence appeared in the local market. Export buyers are holding off. Large quantities are being shipped abroad on consignment by the big companies while many of the European consumers have been purchasing Galician waxes. The asking price for white crude scale 124-126 A.M.P. was 5¼ cents while 124-126 semi-refined was held at 5⅜ cents a pound. For 125-127 A. M. P. fully refined the quotation was 5.95 cents a pound while 128-130 A. M P. was quoted at 6.05 cents and 133-135 A.M.P. at 6⅜ cents a pound.

Gas Oil—New York

Gas oil demand has improved considerably and leading local refiners advanced

36-40 ½-cent a gallon to 6 cents while 28-34 is now held at 5½ cents an advance of ¼-cent for the week. Export demand has been very light but domestic buying is more spirited and refiners are looking forward to a brisk demand. Many are reluctant sellers as they expect to crack large quantities during the spring.

Gas Oil—Gulf Ports

While most of the refiners were asking 5¼ to 5½ cents a gallon for 26-28 transparent gas oil, one or two were still quoting 4¾ cents. The asking price for 32 plus dark oil ranges from 4⅝ to 5 cents a gallon. No bulk sales were reported although on Thursday there was a rumor current that one of the big refiners sold a cargo of gas oil, 35,000 barrels, to the United Kingdom, March loading, but details and confirmation were lacking.

Lubricants—New York

Orders for lubricating oils were strictly hand-to-mouth the greater part of last week. Export buying in most lubes has been very backward. Prices are a trifle steadier reflecting the improvement in other major petroleum products. There was an inquiry in the market from the Continent for a cargo of 25,000 barrels of assorted lubricants, March loading, but this is still pending. Pennsylvania 600 s.r. in barrels, New York is well held at 25 to 26 cents a gallon. Neutral oils are steady but quiet. Paraffin oils were dull.

Lubricants—Gulf Ports

There was a persistent report current that one of the leading independents sold a cargo of 30,000 barrels of assorted lubricants for nearby clearance for Europe. Details were lacking. Prices held fairly steady. Demand from abroad is still lagging, but refiners are more confident of the future and are reticent to consider counter bids. Zero cold test oils are flat.

British Importations

During the week, ended January 18th, there were 14,066,069 gallons of petroleum imported into the United Kingdom. Larger receipts were:—

Consignee	Imperial Gallons	Product	Port of Origin
London:—			
Shell	140,085	Fuel Oil	B. Pappan
Shell	527,784	Fuel Oil	Trinidad
Shell	1,048,551	Benzine	N. Orleans
U. Caucasian	150,000	Gasoline	Westwego
Liverpool:—			
Brit-Mex	1,652,000	Fuel Oil	Trinidad
Bristol:—			
Shell	1,609,195	Benzine	N. Orleans
Shell	1,564,939	Kerosene	Beaumont
Manchester:—			
Shell-Mex	1,211,080	Benzine	N. Orleans
Southampton:—			
Shell-Mex	771,220	Gasoline	S. Pedro
Shell	726,302	Kerosene	Suez
Brit-Mex	1,398,466	Crude	Aruba Isles
Aberdeen:—			
Shell-Mex	471,578	Fuel Oil	Trinidad
Grangemouth:—			
Scottish Oils	2,311,250	Crude	Abadan

New York Export Market

Prices below are an index to the export markets as of the dates given. In many cases they are actual sales prices. So many factors enter into the price in export transactions that an actual market price governing the bulk of transactions cannot be given.

GASOLINE	Feb. 15	Feb. 8
U. S. Motor, Tank cars Ref.	12½	-12
U. S. Motor cases	28.15	-27.15
California grade U. S. Motor F. O. B. N. Y. Bulk	12½	-12½
KEROSENE		
41-43-150 W. W. Tank cars Ref.	09	08¼
41-43-150 W. W. Cases	19.90	-19.90
42-44-110 S. W. Cases	18.40	-18.40
GAS OIL		
36-40, Bulk Refinery	06 -06¼	05¾-06¼
28-34, Bulk Ref	05½-06¼	05¼-06¼
MEXICAN BUNKER OIL		
Grade C, f. o. b- ref., Bulk	1.75	-1.75
Diesel Oil f. o. b. ref., Bulk	2.20	-2.20

LUBRICATING OILS

The following prices are cooperage basis f. o. b. New York, products being manufactured by inland refineries.

CYLINDER OILS (bbls.) 1 inch Immersion Test; All Penna. Products		
Filtered D 600	32	-32
Filtered E 600	30	-30
Unfiltered 600 s. r.	25	-25
Unfiltered 650 s. r.	30	-30
600 flash s. r.	32	-32
650 Flash	42	-42
RED PARAFFIN (bbls.) (Viscosity at 70)		
300 vis. No. 5 color	21¾	-21¾
250 vis. No. 5 color	20¾	-20¾
High Viscosity No. 5 color	26	-26
Neutral Oils (bbls.) (Viscosity at 70)		
200 vis. at F. Pale No. 3 color	-31¾	-31¾
180 Pale No. 3 color	-29¾	-29¾
150 Pale No. 3 color	-24¾	-24¾
BLACK OIL (bbls.)		
25-30 cold test	14 -15	14 -15
15 cold test	15 -15¾	15 -15¾

MEDICINAL OILS (Includes Price of Drums) (Penna. Stocks)	Feb. 15	Feb. 8
Domestic.875-.885s.g.	1.00-1.08	1.00-1.08
Domestic.865-.870s.g.	.75- .80	.75- .80
Russian.885-.890s.g.325-350 vis.	1.20-1.25	1.20-1.25
WAXES (Penna. Stocks) (F. A. S. Carload Lots)		
WHITE CRUDE SCALE		
122-124 A. m. p.	-05¼	-05¼
124-126 A. m.p.	-05¼	-05¼
MATCH		
105-108 A. m. p.	-06	-06
FULLY REFINED		
120-122 A. m. p.	06	-06
123-125 A. m. p. Philadelphia	06½	-06½
125-127 A. m. p.	06¾	-06¾
128-130 A. m. p.	06¾	-06¾
130-132 A. m. p.	06¾	-06¾
133-135 A. m. p.	06¾	-06¾
135-137 A. m. p.	-07¼	-07¼
SEMI REFINED		
122-124 A. m. p.	-05¾	05½
YELLOW CRUDE SCALE		
124-126 A. m. p.	05¼	-05¼

PETROLATUMS (Penna. Stocks) Per Pound		
Dark Green	02¾	02¾
Veterinary	03¼	03¼
Light Amber	03¾	03¾
Dark Amber	03¾	03¾
Cream	06¾	06¾
Lily White	08½	08½
Snow White	11 -11½	11 11½

Gulf Export Market

Gasoline
F. O. B. Seaboard
Shipments of 20,000 Bbls. and over

	Feb. 15	Feb. 8
U. S. Motor, Cargo	11¾-.12	11½-.11¾
60-62 400 e. p. Bulk	.13½	.13½
64-66, 385 e. p. Bulk	14¾-.15	14¾-.15
U. S. Motor, Cases (cargo lots)	2.40	2.35
64-66, Cases (cargo lots)	2.70	2.65
KEROSENE		
Water White, 41-43 bulk	08	-08
Prime White, 42-44 bulk	07	-07
Water White, cases (cargo lots)	1.70	-1.70
Prime White, cases (cargo lots)	1.60	-1.60
DOMESTIC GAS AND BUNKER OIL		
26-28, gravity, bulk*	04¾-05¼	04¾-05
32 plus, bulk, Dark	04½-04¾	04½-04¾
Grade C, Bunker oil	1.60	-1.60
Cargoes	nominal	nominal

*Transparent through neck of a 4 oz. bottle.

MEXICAN CRUDE AND BUNKER OILS F. O. B. Steamer Tampico		
Heavy, Taxes to be added	1.15	-1.15
Grade C, Bunker oil Taxes paid	1.45	1.40
Grade C. Bunker oil F. A. S. New Orleans	1.60	1.60

Lubricating Oils

SOUTH TEXAS

(Viscosity at 100°F; cold test 0)
(Tanker, F. O. B. Houston)

	Feb. 15	Feb. 8
100 Vis. No. 2 Unfiltered Pale	07	07
150 Vis. No. 2½ Unfiltered Pale	09	09
200 Vis. No. 3 Unfiltered Pale	11	11
300 Vis. No. 3 Unfiltered Pale	13	13
500 Vis. No. 3½ Unfiltered Pale	15	15
200 Vis. No. 5½ Red Oil	10½	10½
300 Vis. No. 5½ Red Oil	12	12
500 Vis. No. 6 Red Oil	14	14
800 Vis. No. 6 Red Oil	18½	18½

Pacific Export Market

Cargo lots quotations at seaboard, Los Angeles)

	Feb. 15	Feb. 8
Gasoline, U. S. Motor— 54°—56°	8 -10	8 -10
Gasoline—U. S. Motor blends and special cuts	9 -10½	9 -10½
Gas Oil, 24°—30°B. per bbl.	$1.15	$1.15
Diesel Oil, 27°B—plus per bbl.	$1.15	$1.15
Bunker Oil, 14°—18°B. per bbl.	$1.00	$1.00
Fuel Oil, 14°—18°B. per bbl.	$1.00	$1.00
Kerosene, W. W. 40°—42° B per gal., 125-150 flash test	05 -05½	05 -05½
Cased Goods		
Gasoline, U. S. Motor	$2.35	$2.35
Kerosene, W. W. 40°—42° B per case, flash test 125-150	$1.40-1.50	$1.40-1.50

N. Y. Domestic Market

The following light oil, gas and fuel oil prices are F. O. B. New York refineries, being products made from Domestic (including California) and Mexican Crudes.

	Feb. 15	Feb. 8
U. S. Motor Gasoline, Tank Cars Delivered greater N.Y.	-13½	-13
U. S. Motor Gasoline, Tank Cars Bayonne	-12½	-12
Kerosene, 41-43 150 W. W. Tank Cars Del'd greater N.Y.	-10	-.09¼
Grade C Bunker f.o.b. N.Y. Ref.	1.75	1.75
Diesel Oil f.o.b. Refinery	2.20	2.20
Gas Oil, 36-40, Bulk Refinery	-06	05½-05⅝
Gas Oil, 28-34 Bulk, Refinery	-05½	05¼-05¾

Magnolia Report Shows Draft on Stocks

HOUSTON, Feb. 11.—Magnolia Petroleum Co., pipe line department, announces from Dallas headquarters the following crude oil runs for January, which are shown in comparison with December:

	December	January
Hewitt	90,646.17	86,198.80
Healdton	194,907.09	191,575.81
Cushing	353,100.92	331,002.03
Yale	55,171.75	53,784.61
Cement	21,596.64	21,443.83
Duncan	46,172.89	45,457.17
Augusta, Kans.	39,690.06	36,595.80
Walters-Beaver Creek	9,858.39	7,820.51
Bristow	.....	7,820.51
Burbank	44,683.72	44,091.86
Wewoka	190,127.86	277,776.41
Total Okla.-Kans.	1,045,955.49	1,095,746.83
Thrall	873.47	965.89
Electra	114,643.07	112,506.20
Burkburnett	80,807.13	84,569.24
Henrietta	6,198.73	6,227.16
Corsicana Heavy	7,401.60	7,864.09
Corsicana Light	19,662.44	20,723.86
Comanche	25,123.78	23,431.65
Olden	30,651.33	28,673.63
Stephens	16,916.07	15,522.01
Coleman	487.28	659.96
Mirando	41,607.39	34,873.88
Mexia	26,444.05	8,435.66
Luling	116,136.68	196,851.08
Archer	76,134.78	74,161.84
Lytton Springs	181,296.11	150,409.87
Iatan	7,660.09	6,554.54
Total Texas	752,044.00	772,430.56
Haynesville	6,322.39	5,441.78
Bull Bayou	37,961.76	36,928.99
Cotton Valley	22,795.42	20,471.36
Total Louisiana	67,079.57	62,842.13
El Dorado Light	74,989.36	80,402.91
East El Dorado	2,065.34	2,323.84
Total Arkansas	77,054.70	82,726.75
GRAND TOTAL	1,942,133.76	2,013,746.27

OKLAHOMA-KANSAS

Report for Jan., 1926.		Daily Average
Runs	1,095,747	35,347
Shipments	1,267,082	40,874
STOCKS	5,744,000	

TEXAS

Wichita, Wilbarger & Archer		
Runs	271,237	8,752
Shipments	285,421	9,207
Petrolia		
Runs	6,227	201
Shipments	6,155	199
Eastland & Stephens		
Runs	67,627	2,182
Shipments	90,077	2,906
TOTAL STOCKS	2,237,784.00	

TOTAL STOCKS NORTH CENTRAL TEXAS FIELD ..2,237,784.00

Hanlon Buys Hurley Plants

TULSA, Feb. 15.—The Hanlon Gasoline Co. has purchased two gasoline plants from the Hurley Gasoline Co. The two plants are located in the Breckenridge district in Texas and have a combined capacity of 16,000 gallons per day. The new owners took over the properties on Feb. 11. The Hanlon Gasoline Co. is affiliated with the Chestnut & Smith Corp. which will sell the output of the plants.

Cities Service Buys Joplin Co.

TULSA, Feb. 15.—The Cities Service Co. has purchased properties of the Joplin Gas Co., Joplin, Mo., and at Carthage, Webb City and Centerville. The property has been consolidated with Kansas properties and placed under the management of F. T. Parks, formerly located at Parsons, Kan.

Crude Oil Prices All Fields

ALL PRICES EFFECTIVE, *February 15*

EASTERN FIELDS
Posted by Joseph Seep Purchasing Agency

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$3.90
Bradford District Oil in National Transit Lines (Bradford District)	3.90
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	3.80
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	3.80
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	3.75
Penna. Grade Oil in Buckeye Pipe Lines (Ohio)	3.65
Keister Grade in National Transit Lines (Butler Co.)	$2.45
Gaines, Tioga Co. (Pa.)	2.95
Cabell Grade in Eureka Pipe Lines (West Virginia)	2.20
Corning Grade in Buckeye Pipe Lines (Ohio)	2.25
*Somerset Medium in Cumberland Pipe Lines (Kentucky)	2.30
*Somerset Light in Cumberland Pipe Lines (Kentucky)	2.45
Ragland Grade in Cumberland Pipe Lines (Kentucky)	1.15

*Somerset oil run prior to Oct. 1, 1923, takes price of 6 cents lower than above quotations.

CENTRAL STATES FIELDS
Posted by Ohio Oil Co.

Wooster $2.25	Indiana $2.00	Plymouth $1.65
Lima 2.23	Princeton 2.12	*Canadian Petrolia 2.63
Waterloo 1.10	Illinois 2.12	*Posted by Imperial Oil, Ltd.

OKLAHOMA, KANSAS And NORTH TEXAS FIELDS
(Prices of Prairie Oil & Gas Co.)
(Prairie's prices apply in Oklahoma, Kansas, North and Central Texas.)

28-28.9	$1.40	41-41.9	$2.44
29-29.9	1.48	42-42.9	2.52
30-30.9	1.56	43-43.9	2.60
31-31.9	1.64	44-44.9	2.68
32-32.9	1.72	45-45.9	2.76
33-33.9	1.80	46-46.9	2.84
34-34.9	1.88	47-47.9	2.92
35-35.9	1.96	48-48.9	3.00
36-36.9	2.04	49-49.9	3.08
37-37.9	2.12	50-50.9	3.16
38-38.9	2.20	51-51.9	3.24
39-39.9	2.28	52 and above	3.32
40-40.9	2.36		

Humble Oil & Refining Co. Prices

(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie and Moran crudes all in Texas.)

Effective Feb. 1, Humble posted same gravity and price schedule as that posted by Prairie, excepting that Humble is paying 8c less for each full degree below 28 gravity.

Magnolia Petroleum Co. Prices
In Oklahoma, Kansas and North Texas

Effective Feb. 1, Magnolia posted same gravity and price schedule as Prairie, in all fields where it purchases on a gravity basis, excepting that it is paying $1.20 for all oil below 28 gravity.

Effective Feb. 1, Corsicana heavy was advanced to $1.15 per barrel.

NORTH LOUISIANA—ARKANSAS FIELDS
***Prices of the Standard Oil Co. of Louisiana**

Caddo, below 32	$1.85	Haynesville, below 33	$1.75	Smackover, 24-24.9	$1.25
do 32-34.9	2.00	do 33 and above	1.85	do 25-25.9	1.30
do 35-37.9	2.10	El Dorado, below 33	1.75	do 26-26.9	1.35
do 38 and above	2.20	do 33 and above	1.85	do 27 and above	1.40
Homer, below 31	1.60	Bull Bayou, 32-34.9	1.70	De Soto	2.05
do 31-32.9	1.75	do 35-37.9	1.85	Crichton	1.85
do 33-34.9	1.85	do 38 and above	2.00	Bellevue	1.65
do 35 and above	1.95	Smackover, below 24	1.00	Cotton Valley	1.10

*Same prices maintained by The Texas Co. and Gulf Production Co. The Texas Co. buys in Caddo, Bull Bayou, De Soto, Crichton and Smackover fields.

STEPHENS, ARKANSAS
Posted by Louisiana Oil Refining Corp., and Atlantic Oil Producing Co.

26 and above $1.50 Below 26 $1.30

SMACKOVER, ARKANSAS
Prices of Louisiana Oil Refining Corp.

Below 24	$1.00	25-25.9	$1.30	27 and above	$1.40
24-24.9	1.25	26-26.9	1.35		

GULF COASTAL FIELDS
(Posted by Humble Oil & Refining Co., The Texas Co., Gulf Production Co., Sun Oil Co. and Sinclair Crude Oil Purchasing Co.)

Grades A $1.50 Grades B $1.25

Goose Creek, Hull, Orange and Pierce Junction are the only Gulf Coastal fields that have A and B grade classifications. All other fields are classified as A grades only.

ROCKY MOUNTAIN FIELDS
Prices of Ohio Oil Co. and Midwest Refining Co.

†Salt Creek 29-29.9	$1.48	36-36.9	$2.04	Rock Creek	$2.00
30-30.9	1.56	37 and above	2.12	†Osage	2.15
31-31.9	1.64	Elk Basin	2.15	†Cat Creek, Mont.	2.15
32-32.9	1.72	Grass Creek light	2.15	Sunburst, Mont.	1.15
33-33.9	1.80	Big Muddy	2.00	†Hogback, N. Mex.	2.20
34-34.9	1.88	Lance Creek	2.15	Artesia, N. Mex.	1.70
35-35.9	1.96				

†Posted by Midwest Refining Co. Midwest also buys Grass Creek light, and Elk Basin. The Texas Co. buys Salt Creek crude.

CALIFORNIA
Prices of Standard Oil Co of California

Standard Oil Co. of California on Sept. 22 reduced California crude from 10 to 35 cents per barrel and posted 19 new price classifications in the various fields. Instead of paying the same price for the same gravity of oil in all fields regardless of the value of the oil, as it previously has done, the Standard put into effect a new schedule which provides a different schedule of prices for each field and takes into account the varying values of oils of the same gravity in the different fields.

On Oct. 27, it further reduced heavy oils in amounts ranging up to 15 cents. New base price for heavy oils in the San Joaquin Valley is 75 cents, in Southern California fields, 85 cents, and in the Rosecrans-Dominguez, Santa Maria and Ventura county fields, it is $1 per barrel for 14 to 14.9 gravity. Light oils remain unchanged.

The new complete schedule of prices in California can be obtained from the editorial department of National Petroleum News on application.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are the average market prices for the week on materials used by refiners and compounders , o. b. shipping point as effective this date.

Refiners' Supplies

	Feb. 15	Feb. 8
Soda Ash light 58% bags cwt.	-$1.38	-$1.38
Silicate of Soda 60 deg. drums.....cwt.	- 1.70	- 1.70
Sal Soda wks.....cwt.	1.10- 1.25	1.10- 1.25
Caustic Soda 70% solid..cwt.	- 3.10	- 3.10
Chloride of Lime.....cwt. works.....	-2.00	- 2.00
Sulphuric Acid 60 deg. tank cars f. o. b. shipping point.....per ton	-10.00	-10.00

Compounders' Supplies (Open Market)

Vegetable Oils—		
Linseed carloads spot.....lb.	11.3	11.3
February.....	11.3	11.3
Tanks, spot.....	10.5	10.5
Boiled carloads spot.....lb.	11.4	11.4
*Soya Bean spot, Bbls....lb.	13½	13½
Animal Oils—		
English Degras.....lb.	.05½	-.05½
Domestic Degras, bbls., carloads.....lb.	-.04¾	-.04¾
*Horse.....lb.	-.10	-.10
Oleic Acid—		
Dist. Bbls.....lb.	.10¾-.11¼	.10¾-.11¼
Saponified Bbls.....lb.	.11¼-.11¾	.11¼-.11¾
Castor Oil—		
No. 1 Carlots, Bbls.....	-.14	-.14
No. 3 Carlots, Bbls.....	-.13½	-.13½
Lard Oils—		
Prime Winter Strained. to 1⅛ffa.40‡45c.t.lb.	.17⅞	.18⅛
Extra Winter Strained. 2 to 4⅛ffa.40/45c.t.lb.	.15	.15
Extra..... 4 to 5 ffa.40/45c.t.lb.	.14½	.14½
Extra No. 1 7 to 10 ffa.40/50c.t.lb.	.14	.14
No. 1.....15 to 18 ffa.40/45c.t.lb.	.13¾	.13¾
No. 2.....22 to 23 ffa.40/45c.t.lb.	.13¼	.13¼
Prime Edible Tallow under 1⅜ffa. 40/45c.t.N.Y.....lb.	-.10½	-.11¼
Tallow acidless.....lb.	-.12¾	-.12¾
Lard Stearine.....lb.18	-.18½	.18-.18½
Oleo Stearine.....lb.	-.11¾	-.12
Neatsfoot Oil—		
Pure.....bbls.-lb.	.17¾	.17¾
Extra.....do lb.	.13¾	.14
No. 1.....bbls.-lb.	.13¼	.13¼
Cold pressed.....lb.	.22¼	.22¼
Fish Oils—		
Menhaden Oil		
Light pressed.....gal.	-.70	-.70
White.....gal.	-.73	-.73
Yellow bleached.....gal.	-.75	-.75
*Herring tank cars coast.....gal.	-.50	-.50
Whale, extra winter bleached.....gal.	-.82	-.82
Seal.....gal.		Nominal
Naval Stores—		
Turpentine, N. Y.....gal.	1.01	1.02
Turpentine†.....gal.	.95	.96
Rosin, B. N. Y.....Bbl.	13.40	13.75
Rosin, F. N. Y.....Bbl.	14.50	14.80
Rosin, B†.....Bbl.	11.90	12.90
Rosin, F†.....Bbl.	13.00	13.25
Rosin Oil 1st run.....gal.	.70	.75
Rosin Oil 2nd run.....gal.	.75	.80
Pine Tar—		
Kiln Burnt.....Bbl.	15.50	15.50
Retort.....Bbl.	15.50	15.50
†Savannah, Ga. market.		
*Nominal.		
Alcohol—Denatured Formula 5		
Bbls.....gal.	-45	-45
Drums.....gal.	-35½	-35½

Caustic Soda Cheaper; Acid is Quiet

By Special Correspondent

NEW YORK, Feb. 15.—Following is a review of the markets for oils and supplies used in compounding and refining:

ALCOHOL, dull, weak. Demand very spasmodic and lighter. Recent cuts in denatured tended to discourage buying. Resale offerings larger. Little interest in future deliveries.

CAUSTIC SODA tending lower. Demand much lighter. Stocks piling up as output gains. Export buyers holding off.

ANIMAL OILS steady. Price changes narrow. Buying routine. Oleo stearine slightly easier at 11¾ cents. Demand for prime lard oil trifle better although price is shade lower. Neatsfoot oil marking time. More interest in oleo oil. Domestic degras marking time. Oleic acid quiet.

BLEACHING POWDER demand slightly better. Prices tending higher owing to depleted stocks. Offerings more limited.

SULFURIC ACID marking time. Buying routine. More interest in futures. No price changes.

FISH OILS unchanged. Crude menhaden still 52½ to 55 cents gallon, tank cars factory. Light pressed marking time at 70 cents a gallon, in barrels, New York. Domestic cod oil demand fair at 63 to 64 cents a gallon, barrels. Whale oil less active.

SODA ASH demand trifle better but market quiet. Prices unchanged. Export demand disappointing.

SAL SODA steady under more active inquiry and fair demand. Makers more confident of future.

NAVAL STORES demand lighter. General tendency downward. Buyers holding off. Turpentine stocks larger and tone easier. Rosins moving in a fair way but price trend is downwards. Rosin oils moving in small way. Tar and pitch dull.

Benzol Prices Higher

NEW YORK, Feb. 15.—Higher motor benzol prices are anticipated by the leading marketers as a result of the upward swing in gasoline tank wagon prices. At present most of the big distributors still asking 23 to 24 cents a gallon for Motor benzol in tank cars at the ovens, but offerings are still small although production is steadily gaining.

Consumption and demand have shown marked increases. Big motor fuel mixture makers are anticipating spring and summer requirements, fearing difficulty in securing supplies later on. Pure and 90 per cent benzol were in fair demand. No price fluctuations took place.

Gulf Coast Market Improving

HOUSTON, Feb. 15.—Gulf Coastal lubricant markets are clearing up after their choppy condition of a week ago. Expectation of a possible crude oil advance shortly and a generally better feeling in the market are helping the market slowly from the manufacturers' viewpoint. Gas oil has been advanced ¼ cent.

California Lubricant Prices Reduced

LOS ANGELES, Feb. 15.—The continuation of price-cutting in the sale of lubricating oils on the part of several of the big marketers for the last few weeks has resulted, as was anticipated, in a complete revision of the price schedule on lubricants. Three of the big companies were forced to revise their schedules by cutting the prices from ½ cent to 1½ cents on different grades.

According to marketing managers, the situation was precipitated by the action of the Pan-American breaking into the market and selling off the established quotations of the other big companies in an effort to get business from them. The other companies tried to maintain their schedules but in isolated instances would cut here and there to hold their own business. However, price-cutting like a prairie fire starting in a small way at various points usually gains ground until all the little fires unite into a general conflagration, which was the case in this fight. Other customers of the price-cutters soon learned that lubricants were selling off quoted prices and demanded that they receive equal consideration. The big companies could, therefore, do no less than revise their schedules downward under the circumstances.

The lubricating oil market is in a weakened condition. Several marketers even look for further reductions unless good weather increases the demand.

The market on other oils is featureless, excepting casinghead gasoline which is in a very strong position, the best it has enjoyed in six years. Optimistic casinghead marketers predict that before long casinghead gasoline will be back to the old position it once held of being worth more on the market than finished motor gasoline.

OIL STOCKS AND FINANCES

National Petroleum News

Public Offered Stock As Amerada Control Goes to Americans

Staff Special
CLEVELAND, Feb. 16

PUBLIC affering of stock in the Amerada Corp., holding corporation for the Amerada Petroleum Corp., Amerada Refining Corp., and Alabama Exploration Co., is being made by Dillon Read & Co., New York bankers who have assisted in bringing control of the holding company from England to the United States.

The offering consists of 355,727 shares of no par common stock at $26 a share. Of this issue 125,000 shares represents new financing and 230,727 shares were purchased from existing stockholders, the Lord Cowdray interests of England.

The Amerada Corp., of Delaware as organized in 1920 had outstanding 588,300 shares of common stock, par value $10 a share. Under the re-arrangement of the capital structure 1,000,000 shares of no par stock are authorized. With the new issue there will be outstanding 713,300 shares, prior to which there is no funded debt or preferred stock issued or authorized. Of the authorized stock which remains unissued, 1500 shares are reserved under an existing salary contract and Dillon, Read Co. have taken an option of 200,000 shares at $25 a share. The letter of President E. L. De Golyer to the bankers does not state the length of the option.

9000 Barrels Production

Crude oil production of the corporation's subsidiaries averages more than 9000 barrels per day, according to Mr. De Golyer. Approximately 6000 barrels is of light gravity and comes from Oklahoma and Kansas wells. The remainder is Smackover heavy oil. The subsidiaries have nearly 300 producing wells in 19 fields. Casinghead gasoline production approximates 20,000 gallons daily, Mr. De Golyer says.

Production since the corporation was formed in 1920 has been as follows:

	Casinghead Gasoline Gallons	Crude Oil Net Barrels
1920	.....	267,445
1921	.....	1,726,353
1922	.....	2,196,839
1923	2,559,445	2,865,480
1924	3,738,690	3,303,826
1925	6,145,529	3,919,158

The subsidiaries have more than 250,000 acres of leaseholds in Oklahoma and Kansas and with the new financing plan to extend the operations into Texas.

The corporation has profited each year since its organization and dividends have been paid on the former $10 stock at the following rate: 1922, $1.50; 1923, $1; 1924, $1.50; 1925, $1.50 and $1 in January, 1926.

Year	Net Sales of Oil, Gas and Gasoline	Net Earnings before Depreciation and Depletion	Depreciation and Depletion (Based on Cost)	Net Earnings after Depreciation and Depletion
1920	$ 932,851	$ 396,975	$ 147,829	$ 249,146
1921	2,507,378	1,666,575	987,261	679,314
1922	3,773,447	2,265,161	1,691,872	573,289
1923	4,913,001	3,518,894	1,849,054	1,669,840
1924	4,893,452	3,295,099	2,095,560	1,199,539
1925	8,600,000	4,600,000	2,100,000	2,500,000

*December estimated.

A summary of sales and earnings and reserves follows:

Net profits in 1923, 1924, and 1925 on the amount of $10 stock outstanding at the end of each year have been: $3.11 in 1923; $2.04 in 1924, and $4.24 in 1925. The consolidated balance sheet of the holding corporation and subsidiaries as of Nov. 30, 1925, adjusted to give effect to the new capital stock and its conversion from $10 par per share to no par, and the 10 per cent dividend paid in January, shows current assets of $4,115,266 of which $2,970,406 was cash, and current liabilities of $657,624. The balance sheet follows:

ASSETS

Cash	$ 2,970,406
Accounts, notes receivable	524,726
Crude, less than market	615,767
Gasoline, at cost	4,367
Active leases*	2,112,951
Inactive leases, real estate, etc	2,706,707
Lease equipment*	2,344,991
Gasoline tanks*	333,340
Storage tanks*	253,526
Miscellaneous equipment*	181,972
Warehouse stocks*	429,821
Total	$12,478,574

LIABILITIES

Accounts payable	$ 560,139
Federal income tax reserve	97,485
Capital and surplus (713,300 shares)	11,820,950
Total	$12,478,574

*Less depreciation or depletion.

Mr. De Golyer calls attention to the fact that while its leases, both active and inactive, and lease equipment are carried in the books at $7,164,649, they were appraised by W. E. Wrather at $14,751,449, and that gasoline plants carried on the books at $333,340 were appraised at $750,000. This fact evidently was taken into consideration by the bankers in setting the price on the stock at $26 a share and taking an option on the 200,000-share block at $25 as the balance sheet after deducting depletion and depreciation reserves from the property accounts, as the balance sheet shows a book value of only $16.57 a share. At $26 a share the stock netted more than 13 per cent last year, according to the certified figures supplied by Mr. De Golyer.

Cities Service Co. Calls 7 Per Cent Bonds

NEW YORK, Feb. 15.—Cities Service Co. has published a call for $3,000,000 of its series C and $600,000 of series B 7 per cent convertible debentures to be redeemed March 5 at 102 and interest. After retiral of those debentures only a nominal amount of its high interest bearing obligations will remain outstanding.

In connection with company's plans to refund its debt with lower interest bearing paper, it recently issued $10,000,000 of 6 per cent sinking fund gold debenture bonds.

Shaffers Earnings Higher

CHICAGO, Feb. 15.—Shaffer Oil & Refining Co. reports net operating income of $3,550,984 for 1925 as compared with $2,241,976 in 1924. Condensed comparative statement follows:

	1925	1924
Gross earnings	$12,446,496	$8,796,570
Operating expenses maintenance,		
Net operating earnings	3,550,984	2,241,976
taxes	8,895,512	6,554,594

Cleveland Stock Market

	Par	Feb. 13 Bid	Asked	Last Sale
Canfield Oil Co.	$100	108½	.....	115
do pfd.	100	.....	.....	100
Fred G Clark Co.	10	2¾	4	4
National Refin. Co. x	25	38	41	41½
do pfd.	100	129	135	129½
Paragon Refin. Co.	25	8	8½	8½
do pfd.	100	67	70	67½

x-Exdividend

Transactions In Oil Shares on New York Stock Exchange

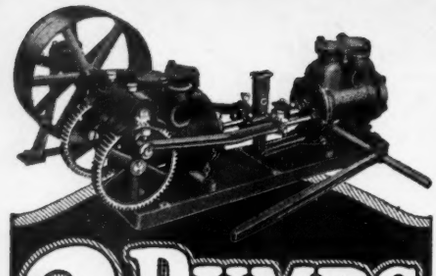
1925 High	1925 Low	1926 High	1926 Low		Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions week ended Feb. 13 Sales	First	High	Low	Last	Ch'ge
79¾	48	74	69	(sh)	200,000	N.P.	American Republics	.....	.....	300	70	71½	70	71½	+1½
47¼	32	59⅛	44¾	$	56,000,000	$25	Associated Oil	50cQ	Jan. 25, 26	99,300	58⅞	58⅞	58¼	58⅝	— ⅜
117½	95½	110	105		50,000,000	100	Atlantic Refining	.....	June 16, 24	2,800	108½	110	106⅜	106⅜	—1⅞
117¾	113½	117	116½		20,000,000	100	do pfd	$1¾Q	Feb. 1, 25	100	116½	116½	116½	116½	0
33½	18¾	33½	29⅜		18,428,350	25	Barnsdall Corp. A	50cQ	Jan. 2, 26	32,400	31	31⅜	30¼	30½	+ ⅜
30	16	29½	25⅜		3,713,275	25	do B	50cQ	Jan. 2, 26	3,800	26½	27	26½	27	+ ¾
⅜	⅛	⅜	⅛	(sh)	150,000	N.P.	Caddo Central	.....	.....	800	⅝	⅝	½	½	— ⅛
34⅜	23⅞	38⅛	30⅝	$	44,923,000	$25	California Petroleum	50cQ	Dec. 1, 25	189,200	36	38⅛	35¾	36⅝	+1⅛
70	42½	73	64		19,834,300	100	General Asphalt	.....	.....	131,000	68	69	65¼	65¾	—2⅜
109	86½	113¾	103½		7,416,000	100	do pfd	$1¼Q	Dec. 1, 25	500	107½	109¾	x106¾	108	+1
59⅛	42	59½	54¾		29,223,650	25	General Petroleum	75cQ	Dec. 15, 25	27,000	58½	58⅞	57	57¼	—1
85	59	72	64		25,000,000	100	Houston Oil	.....	.....	2,000	67½	68	67	67½	+ ½
41¾	13½	34	24½	(sh)	500,000	N.P.	Independent Oil & Gas	25cQ	Jan. 11, 26	24,600	30⅛	31½	29½	30⅜	— ⅛
14¼	5½	13¾	9½	$	3,204,590	$10	Indian Refining	.....	Dec. 15, 20	25,100	11¾	13¾	11⅜	13¾	+1⅝
12⅝	6	12½	9½		4,545,860	10	do ctfs	.....	.....	4,800	11¼	12½	11	12½	+1½
110	77	104	104		2,296,400	100	do pfd	.....	Dec. 15, 21	.....	.....	.....	.....	.....	.....
1½	¼	¾	½		1,678,760	10	Kansas & Gulf	.....	.....	100	½	½	½	½	— ⅛
23¾	13⅜	19⅝	16½	(sh)	1,121,530	N.P.	Louisiana Oil	.....	.....	8,200	17½	17⅝	16⅞	17	—1
35½	20⅜	28⅞	24⅛	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	4,500	25¾	26⅜	25	25¼	—1
60½	32⅝	60¼	55	(sh)	1,894,518	N.P.	Marland Oil Co	$1Q	Dec. 31, 25	81,500	58½	59¾	58	59	— ⅛
250	225	.....	.....	$	45,942,800	$100	Mexican Petroleum	$3Q	Jan. 20, 26	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....		12,000,000	100	do pfd	$2Q	Jan. 20, 26	.....	.....	.....	.....	.....	.....
22½	29	12⅛	9½	(sh)	945,939	N.P.	Mexican Seaboard	.....	Nov. 15, 24	4,600	10	10¼	9¾	9¾	— ⅛
38	25¾	37	33	(sh)	1,357,800	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 23	21,700	35	36	34¼	35	— ⅝
94¼	83	95	94	$	6,718,000	$100	do pfd	$1¾Q	Dec. 1, 25	100	96¼	96¾	96¼	96¼	+2⅛
3¼	⅝	2½	1¼		26,013,760	10	Middle States	.....	July 1, 23	4,000	1⅝	1¾	1½	1⅝	— ⅛
1½	1½	1⅛	⅞		3,786,460	.....	do ctfs	.....	.....	2,000	1	1	1	1	1
78½	51⅝	83¼	74¾	(sh)	3,500,000	N.P.	Pacific Oil	$1.50S.A.	Jan. 20, 26	108,100	82	83¼	80½	83⅛	+ ⅞
83⅞	59½	76½	65¾	$	48,307,400	$50	Pan American P. & T	$1.50Q	Jan. 20, 26	1,500	68¾	69	67⅞	68¼	—1¾
84½	60⅛	78⅜	67		90,484,800	50	do B	$1.50Q	Jan. 20, 26	31,200	70¼	71¼	69	69⅛	—2⅛
49¾	37¼	46	40⅛	(sh)	400,000	N.P.	Pan American Western B	50cQ	Jan 30, 26	6,000	43⅞	43⅞	42½	42½	—1
6¼	2¼	9¼	4½	(sh)	198,770	N.P.	Panhandle P. & R	.....	.....	21,000	7¾	9¼	7	9⅛	+2⅛
60½	37	75	51	$	2,935,200	$100	do pfd	.....	July 2, 23	1,500	75	80⅛	70	75	0
47⅛	36¼	48¾	42¾	(sh)	2,045,381	N.P.	Phillips Petroleum	75cQ	Jan. 2, 26	162,200	45¼	48¾	45¼	48	+2
3½	1¼	1⅞	1⅜	$	29,622,925	$25	Pierce Oil Corp	.....	.....	1,800	1¾	1⅞	1⅝	1⅝	— ⅛
40	20¼	27⅛	24		15,000,000	100	do pfd	.....	Feb. 1, 22	1,000	26	26	26	26	—1
8¼	4½	7	5	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	5,500	6½	6½	6⅛	6⅛	— ⅛
32⅝	12½	17½	14¼	$	11,467,850	$50	Producers & Refiners	.....	Sept. 15, 23	1,000	15	15½	15	15½	+ ½
47⅝	27	35	32¼		2,845,350	50	do pfd	.....	May 1, 25	300	34	35	34	34⅞	+ ⅛
33¾	25⅛	31	28⅝		75,959,250	25	Pure Oil Co	$7½eQ	Dec. 1, 25	26,400	30⅛	30¾	x29¾	29¾	— ⅞
108½	103	108¾	107		13,000,000	100	do 8% pfd	$2Q	Oct. 1, 25	100	109	109	109	109	+ ¾
57⅜	48¼	57⅜	52⅞	(sh)	773,883	13.40	Royal Dutch, N. Y. shares	$1.339	Jan. 29, 26	5,500	54	54¼	53½	53⅝	— ¼
49	39½	48⅝	45⅝	(sh)	93,599	£2	Shell Transport & T	96½e	Jan. 22, 26	.....	.....	.....	.....	.....	.....
28⅜	21⅝	28⅛	25⅝	(sh)	10,000,000	N.P.	Shell Union Oil	35cQ	Dec. 31, 25	27,700	27¾	28	27¼	27¼	— ½
106½	99½	106½	103½	$	20,000,000	$100	do pfd	$1½Q	Feb. 15, 26	200	104½	104½	104½	104½	+ ½
28½	17¾	28⅝	23¾		7,207,620	10	Simms Petroleum	50cS.A.	Jan. 2, 26	85,300	25	28½	24⅜	57⅜	+2⅝
24⅞	17	24½	20½	(sh)	4,489,320	N.P.	Sinclair Consolidated	.....	May 31, 24	119,400	23½	24½	22⅝	24¼	+ ⅝
94⅛	78¾	95	91	$	17,852,200	$100	do pfd	$2Q	Feb 15, 26	400	94⅛	95	94⅛	95	+ ¾
32½	21¾	32⅞	29½		23,024,590	25	Skelly Oil Co	50cQ	Dec. 15, 25	16,600	31½	32¼	31¼	32¼	+ ⅜
67¼	51½	62¼	55⅜		237,610,350	25	S. O. California	50cQ	Dec. 15, 25	97,200	59½	60⅛	58½	59½	+ ⅝
47½	38⅛	46⅜	43⅛		513,456,025	25	S. O. New Jersey	25cQ	Dec. 15, 25	27,700	45	45½	44⅝	44⅝	— ⅝
119	116¼	118	116¾		199,972,900	100	do pfd	$1¾Q	Dec. 15, 25	1,500	118	118	117⅜	117¾	+ ¼
43⅞	38⅛	41⅝	36½	(sh)	1,103,776	N.P.	Sun Oil	25cQ	Dec. 15, 25	1,900	40¼	40¼	39	39	—1¼
6⅛	2	4¼	3	(sh)	1,121,368	N.P.	Superior Oil Corp	.....	Dec. 20, 20	3,200	3½	3½	3⅛	3⅜	— ⅛
55	42¾	54	50¾	$	164,450,000	$25	The Texas Co	75cQ	Dec. 31, 25	21,100	52⅞	53⅝	52¼	52½	— ⅝
23⅜	10⅞	19½	16¼		8,380,340	10	Texas Pacific Coal & Oil	.....	June 30, 23	14,200	17	17⅝	16⅝	16¾	+ ⅛
36⅞	30¼	39¾	34¼	(sh)	2,018,231	N.P.	Tide Water Oil Co	25cQ	Dec. 31, 25	13,100	37¾	37⅞	x36¼	36¼	—1⅝
101	99	103	99	$	25,042,000	$100	do 5% pfd	$1.25Q	Feb. 15, 26	2,100	100⅛	100⅛	98¾	98¾	—2⅜
5⅞	3½	4¾	4	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	12,400	4¼	4¼	4	4⅛	— ¼
43⅜	33	46	37¼	$	40,480,800	$25	Union Oil of California	50cQ	Feb. 10, 26	46,600	44½	45	42⅞	43	—1⅞
134	96¼	94	80		24,423,300	100	Union Tank Car Co	$1¾Q	Dec. 1, 25	700	92	92	x80	89	—1½
117⅛	113¼	116½	114⅝		12,000,000	100	do pfd	$1¾Q	Dec. 1, 25	200	116½	116½	x116½	116½	+ ¼
31¾	25½	29¾	26¼	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Jan. 20, 26	15,600	28½	29¾	28¼	29⅛	+ ⅞

*New High †New Low xEx-dividend Total Sales 1,550,600

Standard Oil Stock Traded In New York Curb Market

1925 High	1925 Low	1926 High	1926 Low		Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions week ended Feb. 12 Sales	First	High	Low	Last	Ch'ge
26⅝	17½	19¾	18	£	4,000,000	£1	Anglo American	32.4cS.A.	Jan. 4, 26	3,100	18⅜	18⅜	18	18	— ⅛
4¼	1⅜	2¼	2	(sh)	500,000	N.P.	Atlantic Lobos	.....	.....	500	2¼	2¼	2	2	— ⅛
12⅜	3	4⅜	3¾	$	10,000,000	$10	do pfd	.....	.....	300	4⅜	4⅜	4	4	— ⅛
240	205	232	226		1,000,000	100	Borne Scrymser	†8$S.A.	Oct. 15, 25	10	229½	229½	229½	229½	0
72	53½	59½	55¼		10,000,000	50	Buckeye Pipe Line	$1Q	Feb. 1, 26	390	57½	58	57	58	+ ½
74	48½	71	65		3,000,000	25	Chesebrough Mfg	62½cQ	Dec 29, 25	200	69½	69½	69½	69½	0
115	110	.....	.....		1,000,000	100	do pfd	$1¾Q	Dec. 31, 26	.....	.....	.....	.....	.....	.....
31½	21⅞	25⅞	23¼		34,914,280	10	Continental Oil	25cQ	Dec. 15, 25	16,800	24	24	x23⅜	23⅝	— ⅛
17½	10	16	15½		1,500,000	25	Crescent Pipe Line	.....	Sept. 15, 23	100	16	16	16	16	+ ½
156	132	137	132		3,000,000	100	Cumberland Pipe Line	$3Q	Dec. 15, 25	.....	.....	.....	.....	.....	.....
96	61	63¾	60		5,000,000	100	Eureka Pipe Line	$1Q	Feb. 1, 26	.....	.....	.....	.....	.....	.....
68½	23½	32½	28		16,000,000	100	Galena Signal Oil	.....	June 30, 25	450	30½	31	30	30¼	— ¾
105	88	94½	88		4,000,000	100	do new pfd	$2Q	Dec. 31, 25	90	88	90	88	88	0
114	95	97½	94		2,000,000	100	do old pfd	$2Q	Dec. 31, 25	.....	.....	.....	.....	.....	.....
95	42¼	99⅝	87¾		43,750,000	25	Humble Oil & Refining	30cQ	Jan. 1, 26	21,700	96½	96½	89½	93	—3½
154½	127	142	135		20,000,000	100	Illinois Pipe Line	$6S.A.	Dec. 31, 25	130	136	137⅛	135¾	137⅛	+2⅛
39¼	27¼	38¾	35½	(sh)	6,491,852	N.P.	Imperial of Canada (new)	25cQ	Dec. 1 25	9,700	36½	37	36	36⅛	0
84	57⅝	65	58	$	5,000,000	50	Indiana Pipe Line	$1Q	Feb. 15, 26	500	62½	63	62½	63	0
35⅜	22⅛	35¼	32⅛	(sh)	7,118,138	N.P.	International Petroleum	25c	Sept. 30, 25	24,500	34⅛	34½	33¾	34	— ⅛
25⅝	16½	20⅝	18	$	6,362,500	$12½	National Transit	1⅔stk.	Oct. 5, 25	900	18¾	19¾	18¾	19½	+ ½
79	49¼	50	39		5,000,000	100	New York Transit	25cS.A.	Dec. 15, 25	50	43	43	43	43	+1½
88	67½	80½	70¾		4,000,000	100	Northern Pipe Line	75cQ	Jan. 15, 26	300	80½	80½	78	78	—2
75¼	60¼	67⅜	61¼		60,000,000	25	Ohio Oil Co	$3S.A.	Jan. 1, 26	1,300	65	65½	64	64¾	— ¼
44½	19	23	16¾		10,000,000	25	Penn Mex Fuel	50cQ	Dec. 31, 25	300	18½	19⅜	18½	19½	+1½
65½	45⅞	60¼	55		60,000,000	25	Prairie Oil & Gas	50c	May 21, 25	10,600	58⅝	58½	56¼	58	— ⅝
129¾	106	127	123¼		81,000,000	100	Prairie Pipe Line	.....	July 31, 25	1,650	125½	126	125½	126	+1
254	200	212	202		4,000,000	100	Solar Refining Co	$2Q	Jan. 30, 26	150	206	206	205	206	+1
103	63	66½	61½		10,000,000	100	Southern Pipe Line Co	$5S.A.	Dec. 19, 25	150	62¼	63	62½	63	+ ½
197	139	197	174		20,000,000	100	South Penn Oil Co	$1Q	Dec. 1, 25	140	178	178	176	177½	—3½
47½	45	50	44½		20,000,000	25	do new	$1.50	Dec. 31, 25	600	45¼	45¼	45	45	— ½
84	50	54½	53		3,500,000	100	South West Pa. Pipe Line	$1Q	Dec. 31, 25	50	53	53	53	53	0
.....	.....	58¾	54½	(sh)	15,000,000	N.P.	S. O. California (new)	62½cQ	Dec. 15, 25	88,600	57⅛	58¾	56	58⅛	+1⅛
70¾	59½	70½	65¼	$	223,756,258	$25	S. O. Indiana	.....	June 16, 24	30,900	67⅛	68¾	66¼	67½	0
46	30⅛	36½	32⅛		8,000,000	25	S. O. Kansas	$1Q	Dec. 31, 25	2,300	33½	33½	32⅛	32¾	—1
137	114¾	134⅜	125⅜		16,864,434	25	S. O. Kentucky	$5S.A.	Dec. 19, 25	1,200	126¾	126⅞	125¼	126	—1
270	231	254	239½		3,000,000	100	S. O. Nebraska	35cQ	Dec. 15, 25	50	248	250	248	250	+ ½
48⅝	40½	47¼	35		227,535,300	25	S. O. New York	$2½Q	Jan. 1, 26	10,600	36⅛	36⅛	35⅞	36	— ⅛
369	338	362	339½		14,000,000	100	S. O. Ohio	$1¾Q	Dec. 1, 25	50	350	352	350	352	+1
123	116	118½	117		7,000,000	100	do pfd		Nov. 1, 19	100	117¼	117¼	117	117	+ ½
27	12	23	20		1,722,931	25	Swan-Finch Co	‡50eQ	Dec. 19, 25	150	20	20	19⅞	19⅞	— ⅛
109½	80⅛	109¼	103½		61,919,950	25	Vacuum Oil Co	$2	Dec. 31, 25	12,000	105⅜	105⅜	103⅝	105⅜	+ ½

Borne Scrymser $2 extra April 15 $4 extra Oct. 15 ‡Vacuum 50c extra Mar. 20, June 20, Sept. 19 Dec. 19 Dec. 19 special $1 Dec 19 S.O. Neb. $10 extra Dec. 19 special $1 Dec. 19 S. O. Neb. $10 extra Dec. 19 Ohio Oil 50c extra Dec. 31. Chesebrough 62½c extra Dec. 29



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- One Gasoline
- One Kerosene

Both are mounted on a one-piece cast iron base with power jack attached. Easy to install. Will operate without vibration or movement on any kind of foundation.

Either pump may be connected to the cross-head by two machine bolts and operated separately or together.

Cast iron base under pumps forms oil pan which is tapped for drain pipe, insuring a safer and cleaner pump house.

Plunger, slow speed, and packed with special cup leathers—a special safety feature.

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Simple in construction, easily installed and easily kept in continuous service by the average operator. Designed for the continuous pumping of kerosene, distillate and gasoline. Made for hand power, engine power, or electric power; belt or gear drive.

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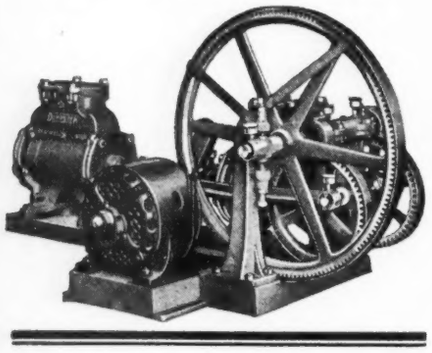
Builders of satisfactory pumps and pumping equipment for over 40 years.



New York Bonds

Week Ending Feb. 11

	High	Low	Last	Ch'ge
Amer Rep Cor Deb 6s	99⅛	98⅞	99⅛	+1
Associated Oil gold 6s	103	102¾	102¾	— ¼
Atlantic Refg. deb 5s	100⅛	100¼	100⅛	— ⅛
Barnsdell Corp. 8s	105⅝	105⅜	105¼	— ¼
Barnsdell Corp. 6s	100⅝	100	100⅝	+ ⅝
Calif Petrol sf 6½s	104⅜	103¾	103¾	— ¼
Empire Gas & F 7½s	102⅝	102	102½	— ⅛
Gen. Asphalt 6s	105½	105⅜	105⅜	— ¼
Humble Oil & R 5½s	102⅛	102	102⅛	+ ⅛
Mid-Cont. Pet. 6½s	103½	103⅜	103⅜	+ ¼
Pan-Amer. P. & T. 7s	106	106	106	— ⅛
Pan-Amer. P. & T. 6s	108¼	107⅞	107⅞	— ⅜
Pierce Oil Deb. 8s	106	106	106	— ⅛
Producers & Refnrs. 8s	110¾	110	110	—2¾
Sinclair Con Oil Col 7s	96¼	95	96¼	+ ¾
SinclairConOilcon6½s	90⅜	89⅝	89⅝	— ¼
Sinclair Con Oil 6s	113	110⅜	100¾	— ¼
Sinclair Crude Oil 6s	100⅜	100¾	100¾	— ¼
Sinclair Pipe Line sf 5s	90⅜	90¼	90¼	— ¼
Skelly Oil 6½s	129½	125	127	0
Superior Oil 7s	97	96⅛	96¼	+ ¾
Union Oil of Calif 6s-A	104⅞	104½	104¾	+ ¼
Union Oil of Calif 5s-C	97	96⅛	96¾	— ⅛
Union Oil of Calif 1st 5s	100¾	100½	100⅝	0

New York Curb Bonds

Week Ending Feb. 11

	High	Low	Last	Ch'ge
Atl. Gulf and W I 5s	73¼	72¾	73¼	+ ½
Cities Service 6s	93¼	93⅛	93⅛	0
Cities Service 6s w i	93¼	93¼	93¼	0
Cities Service 7s "B"	178	178	178	0
Cities Service 7s "C"	125¾	125½	125¾	+ ¼
Cities Service 7s "D"	102	101⅝	101¾	0
Galena S. O. 7s	102⅜	102⅜	102⅜	+ ⅛
General Pet. 6s	101¾	101½	101¾	— ⅛
General Pet. 5s	94½	94	94⅛	— ⅜
Gulf Oil 5½s '27	100½	100½	100½	— ½
Pan Amer Pet 6s	103¾	103⅝	103½	+ ¼
Pure Oil 6½s	103½	103	103¼	+ ⅛
S O N Y 6½s	106¾	106½	106½	0
Sun Oil 5½s '25	99¾	99	99¾	+ ¼
Tidal Osage 7s	104⅝	104	104	0
Trans. Cont. Oil 7s	96	95½	95½	— ⅝
United Oil Prod. 8s	40	39½	40	+2
Vacuum Oil 7s	104½	104¼	104½	+ ¼

New York Curb Market

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions week ended Feb. 11 Sales	First	High	Low	Last	Ch'ge
11½	2½	14½	7¼	....	Amer. Maracaibo	55,800	9⅜	10¼	8¾	9¼	—1¼
8⅜	5	6¾	6	$10	Arkansas Nat. Gas.	200	6	6¼	6	6¼	0
.....	.....	19¼	18¼	N.P.	Beacon Oil	3,700	18¾	18⅞	18¼	18½	0
47½	38	.....	.....	$25	British-American	.....	.....	.....	.....	.....	.....
10¼	2¾	22¾	10	25c	Carib. Syndicate	124,000	17	17⅜	14¼	15¼	+ ¾
43	35	38⅞	37½	$20	Cities Service	8,400	37¾	38⅜	37¾	38⅜	+ ⅜
85⅛	80½	84	83¼	100	do pfd.	1,100	83¼	83½	83¼	83½	0
8	7¼	7½	7⅜	10	do pfd. B	300	7⅜	7⅜	7⅜	7⅜	— ⅛
21¾	17½	19⅜	19	10	do bankers' sh	.....	.....	.....	.....	.....	.....
2¾	.60	3½	2½	N.P.	Colombia Syndicate	63,800	3	3⅛	2⅞	3⅛	+ ⅛
15	8¼	15¼	13¾	N.P.	Creole Syndicate	2,900	14¼	14¼	13¾	14	— ¼
12¼	5	7⅜	4¾	N.P.	Crown Central	4,000	5	5½	4¾	4¾	— ¾
7	2	3¾	2⅜	N.P.	Derby Oil & Ref	200	2½	2½	2½	2½	0
27	10½	14⅞	13½	N.P.	do pfd.	.....	.....	.....	.....	.....	.....
6	1⅜	6½	5	N.P.	Gibson Oil	17,600	5⅜	5⅞	5⅜	5⅞	+ ⅜
3¾	1⅜	2	1¼	N.P.	Gilliland v.t.c.	.....	.....	.....	.....	.....	.....
98¼	63½	93¾	86½	$25	Gulf Oil Corp.	4,100	90⅛	90⅛	88½	88½	—2
5⅞	2¼	3¾	2¼	N.P.	Kirby Petroleum	100	.....	2⅝	2⅝	2⅝	— ⅜
23¼	17⅞	25⅞	21	N.P.	Lago Oil & Trans. A	93,300	25⅝	25¾	23¼	24½	—1⅛
11¾	4⅝	13	10½	N.P.	Lago Petroleum	12,400	12⅞	13	11¾	12	— ⅜
13	6	11½	9	N.P.	Leonard Oil & Dev.	40,800	10½	10¾	10	10½	— ⅜
25⅜	18	25½	23¾	N.P.	Lion Oil Refining	2,200	24	24½	23¾	24¼	+ ⅛
4½	1¾	.....	.....	N.P.	Marland of Mexico	.....	.....	.....	.....	.....	.....
5¾	.56	5½	5	$10	Mexican-Panuco	18,500	5⅜	5½	5	5⅛	— ⅜
2	1	1¾	1⅝	1	Mountain & Gulf	300	1⅜	1⅝	1⅝	1⅝	0
26¼	18⅜	26	23¾	10	Mountain Prod	14,200	24⅜	24⅜	24¼	24½	— ½
6¾	3⅝	6¾	6	5	New Bradford	7,600	6½	6¾	6¼	6⅜	— ⅛
24¾	16¼	5	5	10	New England Fuel	.....	.....	.....	.....	.....	.....
19¾	6¼	17	12¾	1	New Mex. & Ariz	7,600	13⅜	13⅝	12¾	13¼	— ¼
12½	8¼	17	11⅜	25	New York Oil	200	13½	13½	13	13½	— ½
37	14	36	34⅛	25	Ohio Fuel Corp	.....	.....	.....	.....	.....	.....
2½	.90	2¾	2	N.P.	Peer Oil Corp	4,400	2⅝	2⅝	2	2¼	— ⅜
28¼	16	22¾	20⅞	$10	Pennok Oil	.....	.....	.....	.....	.....	.....
44½	16	21½	17⅞	25	Red Bank Oil	1,200	20	20¾	19⅛	19½	— ⅜
33½	19	24⅞	14½	N.P.	Reiter-Foster	70,000	22¾	22¾	20¾	21	—2
9½	3½	7½	5⅜	N.P.	Ryan Consolidated	700	6	6¼	5⅞	5⅞	— ⅜
9¾	6⅜	10	9	$10	Salt Creek Cons	4,800	9⅞	10	9¾	9⅞	— ⅛
35	24	36	31½	10	Salt Creek Prod	6,100	32¾	32¾	31⅞	32½	— ¼
3⅞	1	2	1⅝	5	Savoy Oil	900	2	2	1¾	1¾	0
13¾	9	10	9	10	Tidal Osage	.....	.....	.....	.....	.....	.....
10⅞	8	10	9	10	do non-voting	.....	.....	.....	.....	.....	.....
4⅞	1¾	8	4¼	5	Venezuelan Pet	79,500	6½	8	6½	7¾	+ ¾
.....	.....	29¾	24⅞	....	Warner-Quinlan w.i.	3,500	28¾	29	27⅞	27⅞	—1⅛
31¼	22¾	27⅛	25	N.P.	Wilcox O. & G. new	700	25½	25¾	25⅜	25¾	+ ¼
7	3⅞	6	5¼	N.P.	Woodley Petroleum	300	.....	5⅞	5¾	5⅞	+ ⅜

Pittsburgh Stock Exchange

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions Week Ended Feb. 11 Sales	First	High	Low	Last	Ch'ge
8¼	5¼	7	6	$10	Arkansas Nat. Gas	2,425	6⅛	6¼	6⅛	6⅛	0
73½	69¼	.....	.....	N.P.	Columbia Gas	.....	.....	.....	.....	.....	.....
21½	21½	.....	.....	50	Consolidate Gas pfd.	.....	.....	.....	.....	.....	.....
18	14½	17	16	$10	Devonian Oil	649	16¼	16⅜	16	16	— ¼
112¾	105⅜	114	112¼	$100	†DuquesneLt.7s pfd.	120	114	114¼	114	114	0
95	90	.....	.....	100	Fayette County Gas	.....	.....	.....	.....	.....	.....
.....	.....	9¼	9¼	....	HoustonGulfGas(w.i.)	250	9¼	9¼	9¼	9¼	0
55	32½	56½	51¾	25	Lone Star Gas	1,945	55¼	55¼	54½	54½	— ¾
7	3¾	6½	6	....	do Rights	.....	.....	.....	.....	.....	.....
37¼	31	36½	35	25	Ohio Fuel Corp	3,032	35⅞	36	35½	36	+ ⅛
34	26	34	31½	25	Oklahoma Nat. Gas	1,385	32½	33	32¼	33	+ ½
8¾	5	5⅝	5¼	5	Pittsburgh O. & G	.....	.....	.....	.....	.....	.....
9⅝	6	10	9	10	Salt Creek Cons	1,260	10	*10	9⅞	9⅞	+ ⅛
13¾	8½	10	9¾	10	Tidal Osage	25	9¾	9¾	9¾	9¾	— ⅛

Pittsburgh Curb Market

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions Week Ended Feb. 11 Sales	First	High	Low	Last	Ch'ge
20	18½	.....	.....	....	Central Ky. Gas	.....	.....	.....	.....	.....	.....
2½	.60	3⅛	2¾	$ 5	Colombia Synd	.....	.....	.....	.....	.....	.....
.60	.15	15	15	5	Duquesne Oil	3,000	.15	.15	.15	.15	0
9	5¼	.....	.....	10	Forest Oil	.....	.....	.....	.....	.....	.....
92⅜	64	91½	90	25	Gulf Oil Corp	.....	.....	.....	.....	.....	.....
.....	.....	10	6½	....	Houston Gulf Gas	.....	.....	.....	.....	.....	.....
12⅜	3¼	11⅜	9⅝	N.P.	Leonard Oil & Dvlp.	100	10¾	10¾	10½	10½	— ¼
2¾	1⅜	.....	.....	1	Oklahoma Eastern	.....	.....	.....	.....	.....	.....
¾	⅜	.....	.....	....	Okla. Eastern rts	.....	.....	.....	.....	.....	.....
1⅞	1⅜	.....	.....	....	Okla. Eastern ex-rts	.....	.....	.....	.....	.....	.....
.47	.20	.20	.20	10	Omar O. & G	1,000	.20	.20	.20	.20	0
27½	25	33	27	10	Plymouth Oil	100	29	29	29	29	—1
7	3	4	3	5	States Oil	.....	.....	.....	.....	.....	.....
4	1⅞	3⅛	2⅝	$ 1	Texon Oil & Land	2,700	3	3	3	3	0
11	9	9½	9¼	10	Tidal Osage	.....	.....	.....	.....	.....	.....

*New High †New Low xEx Dividend

Standard Stockholders Approve Merger

CLEVELAND, Feb. 15.—Stockholders of the Standard Oil Co. of California meeting last week in San Francisco voted overwhelmingly for the consolidation with the Pacific Oil Co. Of the 9,516,434 shares outstanding 7,677,057 voted for the merger. This was 80.67 per cent of the stock. Only a two-thirds majority was necessary. President K. R. Kingsbury announced that stock in the new Standard Oil Co. of California would be distributed as soon as consolidation can be effected.

Henry de Forest, chairman of the executive committee of the Pacific Oil Co., issued the following statement concerning the acquisition of Associated Oil Co. stock by Blair & Co. and the Chase Securities Co.:

"Certain of the larger stockholders of the Associated Oil Co., including the Standard Oil Co. of California as to the shares it would receive from the Pacific Oil Co., have agreed to sell to Blair & Co., Inc., and the Chase Securities Co. a minimum of 25 per cent of the capital stock of the Associated Company, payment to be made at the option of the sellers, either in cash at the rate of $59 per share, including the dividend of 50 cents per share payable April 25, 1926 or in certain other securities, the nature of which will be made known later, on or before March 12, 1926.

"In connection with this agreement, the purchasers agree that all stockholders of Associated Oil Co. shall have the right to sell or exchange their stock upon the same terms.

"As the Pacific Oil Co. will be the registered owner (on the record date, viz., March 4, 1926, for purposes of this dividend) of the shares of Associated Oil Co. that may be distributed to the stockholders of the former company on March 6, 1926, the dividend allocable to the Associated Oil Co. shares involved in this distribution will be paid to Pacific Oil Co. and the latter's shareholders will receive it in connection with any further distribution of its assets that may be made.

"The result will be that Pacific Oil Co. stockholders desiring to sell their Associated Oil stock for cash will receive $58.50 per share."

The bankers have not yet announced for whose account the Associated stock was purchased.

Holmes Transferred to Texas

TULSA, Feb. 15.—W. K. Holmes, general superintendent of the West Tulsa refinery of the Texas Co., has been transferred to that company's plant at Port Arthur, Tex. Mr. Holmes has been superintendent at West Tulsa for over 10 years during which period the plant has grown from a small skimming plant to a large skimming and cracking plant with a capacity of 10,000 barrels per day. P. L. Drake of Tulsa will succeed Mr. Holmes.

The Oil Industry Exchange

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Construction Engineer. Sixteen years experience on refineries, oil depots, power houses, etc. in America, Mexico and Japan. Technical education. Location immaterial. Available immediately. Box 521.

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Filter Equipment for Sale

All or part of complete filter equipment consisting of 5-Three ton, and 6-Two ton capacity filters. Mounted on separate steel frame. 5 Steel earth cars—2 Steel charging cars on track. Also one new Century Earth Burner—All in good condition—very low price. Address: The Superoil Company, Toledo, Ohio.

Have You Any Used Equipment to Sell?

If you have, National Petroleum News can put you in touch with buyers. Look over your old equipment, jot down what you don't need and send in a little "For Sale" advertisement.

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